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MAY, 1930

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QST



The Official Organ of the A.R.R.L.

VOLUME XIV

MAY, 1930

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QST is published monthly by The American Radio Relay League, Inc., at Hartford, Conn., U. S. A.
Official Organ of the A.R.R.L. and the International Amateur Radio Union

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Editorial Offices 1711 Park Street, Hartford

Subscription rate in United States and Possessions, Canada, and all countries in the American Postal Union, \$2.50 per year, postpaid. Single copies, 25 cents. Foreign countries not in American Postal Union, \$3.00 per year, postpaid. Remittances should be by international postal or express money order or bank draft negotiable in the U. S. and for an equivalent amount in U. S. funds.

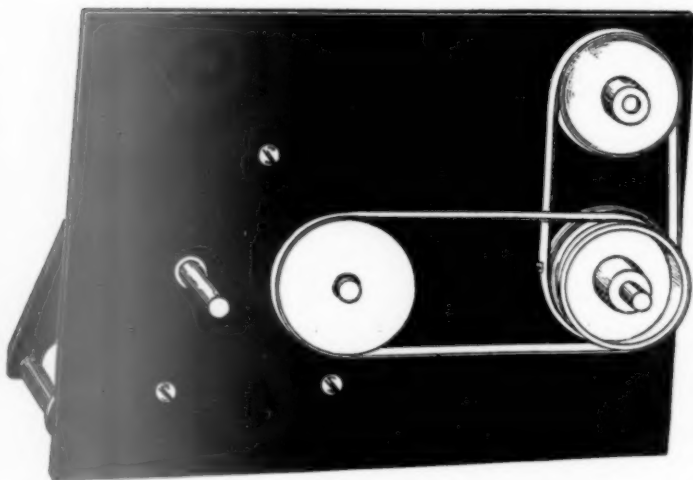
Entered as second-class matter May 29, 1919, at the post office at Hartford, Connecticut, under the Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in section 1103, Act of October 3, 1917, authorized September 9, 1922. Additional entry at Concord, N. H., authorized February 21, 1929, under the Act of February 28, 1925.

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Range 15 to 90 meters. Easiest tuning short-wave receiver known. The tuning unit consists of two controls. The right-hand control, which will be termed the shift control, and the left-hand control, the actual tuning device. In addition to these two controls it will, of course, be necessary to have a regeneration control. For those who desire to employ it for television or the upper phone band, a special attachment may be secured.

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The tuner is operated in the following manner. As a specific example, with the right-hand dial set at nine degrees, revolving the left-hand dial through 180 degrees, you will cover from 19.1 to 22.6 meters. The next step will be to move the shift dial to 13 and tuning over 180 degrees, as before, this time covering from 21.9 to 25.7 meters. This process is continued through 180 degrees on the shift dial until you have reached the maximum automatic wave length, which is 90 meters.

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EDITORIALS

IN middle March the Federal Radio Commission held a conference to discuss general revision of the amateur regulations. Although primarily an informal conference between the Government and representatives of the American Radio Relay League, public announcement of the meeting had been made and general invitations issued, and when we amateur representatives walked into the little conference room it was pretty well filled with representatives from many a government agency and a few commercial activities.

Apparently it was going to be a bigger show than we had thought. "What are all these people doing at an informal conference between A.R.R.L. and the radio authorities?" we thought. Then the meeting got under way and we began to see. Would you believe it? — every last one of them had come over to that meeting prepared to give aid to the amateur, because they had heard that there was to be a public meeting and they suspected somebody might be on hand to start something. But there was nobody to fight, so the meeting ran smoothly and "a good time was had by all." To us it was another convincing illustration of the strong position occupied by our amateur radio.

It is very probable that when new regulations are issued they will require the use of adequately-filtered d.c. plate supply in self-excited circuits. There is now an overwhelming general amateur sentiment against a.c. plate supply in such transmitters, whether it's "raw a.c.," "bum r.a.c.," or even full-wave self-rectifying of the ordinary species — and all of this whether it's 25 cycles, 60 cycles, or 500. Although our Technical Development Program showed that the skilled amateur could achieve satisfactory results with such power sources if he observed extreme care, we all know that in practice it doesn't happen and that such plate supplies on ordinary transmitters are the cause of the broad and selfish signals that infest our bands. Such signals suffer from "wobulation" — frequency modulation — and the time has come, as it did to Spark, when they must go. Of course if the "wobulating" can be avoided, the outputs from modulated plate supplies suffer only from side-bands, which isn't nearly as serious an ailment. For instance, it should be and doubtless will be perfectly permissible to use such unfiltered power supply on the *amplifier* stages of crystal-controlled transmitters. But kiss it good-bye on such transmitters as one-tube Hartleys (or does one say "Hartlies"?) and prepare to use the genuine pure d.c.

While we're talking about the regulations: the Radio Division tells us that there are still amateurs who think a station license conveys the right to operate a station wherever they happen to move. It doesn't. It is a license for a definite and specified location. When you move it's all off. Write your Supervisor for new blanks — you'll retain your old call and stay out of jail.

IS anybody interested in amateur facsimile transmission? It's authorized in our 1715-2000-kc. and 56-mc. bands, but we've never heard of any amateurs experimenting with it. If some inexpensive apparatus could be devised, it seems to us it would offer opportunity for a new form of amateur communication: drawing pictures at the other fellow. We've thought ourselves of the possibility of avoiding cylinders and gears and photo-electric cells by an amateur makeshift that might use wide adding-machine tape in rolls and scan it in short strokes across the tape. Pick up your fountain pen, write

your message in carbon ink, stick the end of the tape in your transmitter, and watch it buzz off. Much amateur conversation relates to the pet hook-up in use or to the habits of some circuit. What more to the point than the ability to draw the circuit, possibly with a big arrow running to the part under discussion and appropriate marginal notes on the relative absence of intelligence in one's correspondent?

One of the biggest problems in television and picture transmission is synchronization. Left to chance, the result is hopeless. The few methods that have been devised for accomplishing it via radio are both complex and expensive, so much so that they practically prohibit amateur participation. We have a thought we want to submit on that. If 60-cycle juice were the same everywhere, the problem wouldn't exist. Synchronous motors would assure synchronism. Why have we no national standard for "60 cycles"? This, it seems to us, is a job for the Bureau of Standards. They have the national standards of weight and measure, from which all our working standards are derived. This 60-cycle standard is a little different. It exists only as it oscillates. It's in the class with the standard-frequency signals. It ought to be a standard-frequency signal. There we have it! Why shouldn't the government establish one or more radio stations which would run continuously and whose outputs would be modulated at the national standard for 60 cycles, to serve as a standard not only for periodicity but also for *phase*? These signals could be received everywhere and all the power companies could use them to govern their output. Thus all the 60-cycle outputs in the country would be in synchronism and in phase, time-keeping would be automatic, and synchronization would disappear as a problem in television and picture transmission.

K. B. W.

A.R.R.L. Headquarters to Have an Accurate Frequency Standard

THE requirements for precision frequency measurement in this day and age of amateur radio are considerably higher than those of the not-far-distant past, and frequency-measuring equipment that was good enough for us a year or so ago is hopelessly inadequate today. That the A.R.R.L. may keep abreast of the times in frequency measurement, the Executive Committee has approved the acquisition of an authoritative secondary frequency standard for Headquarters and the equipment is now in the process of construction by the General Radio Company, at Cambridge, Mass.

The official A.R.R.L. Frequency Standard will be of the piezo-controlled type. The standard crystal will have a frequency of 100 kc., and will be mounted in a heater box with accurate temperature control. In order that useful harmonics in all the amateur bands can be obtained, the output of the oscillator will be fed into a multi-vibrator unit which can be adjusted for operation at either 50 or 100 kc. This will provide useful harmonics throughout all the amateur bands at 50- or 100-kc. intervals. A complete description of

the official standard will be published in QST at a later date.

The accuracy of the standard will be better than 0.01%, and it will be calibrated against the National Standard at the Bureau of Standards, Washington, D. C., before it is installed at Headquarters. With this equipment it will be possible to make frequency measurements to an accuracy of better than 1 part in 10,000. This means that a frequency can be checked to within approximately 1000 cycles at 14,000 kc.

Besides being used for the calibration of auxiliary frequency measuring equipment, the standard will be employed in checking the frequencies of commercials which sometimes wander into our bands as well as for measuring the frequencies of amateur stations who wander outside the bands. The transmissions of W1MK will be monitored at frequent intervals, and it is probable that W1MK will soon be transmitting band-marking frequencies monitored by the standard as a supplementary service to the present A.R.R.L. standard frequency transmissions of W1AXV and W9XL.

League members can well be proud of their Official Frequency Standard, since its accuracy will be exceeded only by that of the best primary standards, and they may rest assured that its utility will be extended to serve the fraternity at large in every way practically possible.

—J. J. L.

Airplane Radiophone Communication Experiments

By C. H. Vincent*

DURING the past five years it has been my privilege to do quite a lot of experimental radiophone work and when the attempts — successful and unsuccessful — to use radio telegraph on transatlantic 'planes were read of, it was natural to wonder how high frequency radiophone signals would work out under such conditions. About this time an opportunity to listen in on some of the early super-sensitive 900-meter receivers was offered and, after standing the terrible punishment from static crashes for a short time, it was decided that such low frequencies would never do for airplane radiophone work unless both the ground station and the airplane station could have very high power. Also, it seemed that the long antenna necessary for such low frequencies would be a decided drawback, unless the 'plane was a very large one with an operator constantly on duty, in which case radio telegraph communication could be used just as well.

About the first of November, 1928, this matter was discussed with Captain L. M. Woolson, Aviation Engineer for the Packard Motor Car Company, and it was agreed that a 'plane powered with the Diesel type engine — then being developed under his supervision — would be exceptionally useful in making preliminary surveys, since that arch-enemy of high frequency reception, the electrical ignition system, would not have to be considered. Upon taking the matter up with the Packard management they advised that they would be glad to cooperate in any such undertaking for the betterment of aviation providing it did not interfere too much with the engine development program which demanded first consideration. This arrangement was agreed upon and it is a pleasure to state that they have more than lived up to their promise.

Applications for experimental licenses to carry on test work on various frequencies between 1600 and 10,000 kilocycles were made on November 15, 1928. After giving the matter due consideration, the Federal Radio Commission

granted these licenses, specifying certain frequencies, including 1608, 2302, 3076, 4108, 6155 and 8650 kilocycles.

Pending receipt of the experimental licenses, a preliminary survey was started with a simple but highly efficient two-tube receiver in a 'plane, and a ground station using Army frequencies with an Army call which the Signal Corps very



THE PACKARD-DIESEL POWERED RADIO TEST 'PLANE IN FLIGHT OVER THE PACKARD PROVING GROUNDS

Using a fixed doublet antenna and a 7.5-watt transmitter on the Stinson-Detroiter 'plane, two-way telephone communication with the ground station has been effected over ranges of 200 miles and more. High-frequency reception on the 'plane is possible because the motor has no electrical ignition system to cause interference.

kindly provided. These preliminary tests gave us a chance to find out approximately how much power would be required at the ground station and enabled us to try out the various types of receiving antennas which might be used. Incidentally the antenna worked out at that time as best for reception has also proven the best radiator for transmission.

Upon receipt of experimental station licenses, the ground station was enlarged to 250 watts (with 40- to 60-percent modulation) and the antenna system improved. A small portable transmitter-receiver was purchased from the Radio Engineering Laboratories and rebuilt to suit airplane work. The first successful two-way radiophone communication took place June 3, 1929.

The airplane station at that time was operating on 8650 kilocycles and although excellent reports were received from points 300 to 400 miles distant, the local "understandable" range was only 10 to 25 miles, depending upon the altitude

*W8XBX-W8RD, Packard Proving Grounds, Route 1, Uden, Mich.

of the 'plane; between this range and 125 miles or more, skip distance was effective.

During the next six months or up to December 16, 1929, tests were run off at every opportunity but no regular schedule could be followed since the Diesel engine development work took up much of the pilots' time and it was necessary to accommodate the radio work to their convenience. At best, however, such surveys require a



PYREX LEAD-IN BOWLS ARE MOUNTED ON THE ROOF OF THE CABIN

Stay-wires to the mounting blocks on the front edge of the wings relieve the lead-in insulators of mechanical strain.

great deal of time since the limited space in the ordinary 'plane, plus the vibration and noise together with changing altitude and the limitations as to plate power and antenna location, all tend to confuse the results.

During the winter just past, weather conditions were very severe, the flying field being covered with deep snow most of the time and high winds prevailing. The test pilots, therefore, did most of their flying in a Waco sport 'plane (equipped with skis) instead of the larger Stinson-Detroit in which the transmitter was installed. Advantage was taken of this enforced idleness, however, to revamp the transmitter-receiver for the airplane station, increasing its output about 10 percent and the receiver sensitivity about 500 percent. The rebuilt transmitter uses one Type '10 oscillator in a loose-coupled high-C Hartley circuit and one UX-842 modulator.

To date it has been impossible to secure a satisfactory "anti-noise" microphone that will pass speech frequencies without general background noise, but this has been overcome to a considerable extent by providing a speech-input gain control. In practice the operator keeps the gain rather low and compensates by talking quite loudly—a very natural thing to do when riding in a noisy 'plane with the head incased in a heavy helmet.

Commercial aircraft will, of course, have sound proof cabins for such work—in fact I recently rode in a 'plane where conversation could be carried on at ordinary voice levels, even with the motor pulling at full power.

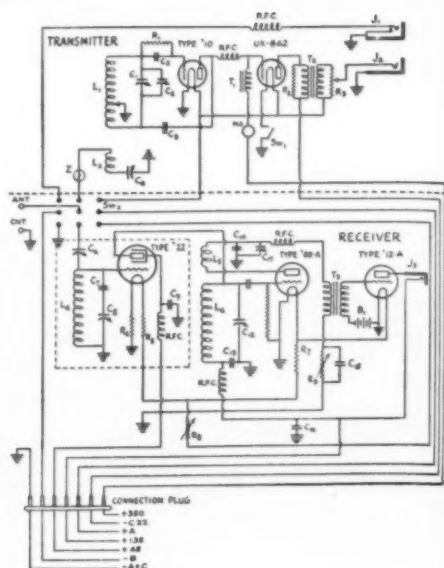


FIG. 1.—THE CIRCUIT DIAGRAM OF THE AIR-PLANE TRANSMITTER-RECEIVER

"Grounds" indicate connections to the shielding.

The Transmitter:

- L_1, L_2 —REL plug-in tank and antenna inductance.
- C_1, C_4 —Cardwell 300- μ fd. variable condensers.
- C_2 —3-plate Hammarlund midjet condenser.
- C_3, C_5 —.002- μ fd. Sangamo fixed condensers.
- R_1 —5000-ohm grid leak.
- R_2 —4-megohm grid leak.
- R_3 —400-ohm Centralab potentiometer.
- RFC—REL radio-frequency chokes.
- T_1 —Modulation choke, 6-henry 150-ma.
- T_2 —Acme A-3 microphone transformer.
- Z —Lamp resonance indicator.
- J_1 —Telephone jack.
- J_2 —Microphone jack.
- MA—0 to 150-millamp. milliammeter.
- SW₁—Modulator filament switch.
- SW₂—Main control switch.

The oscillator tube is a Type '10 and the modulator is an UX-842. A Type '50 tube could be used instead of the UX-842.

The Receiver:

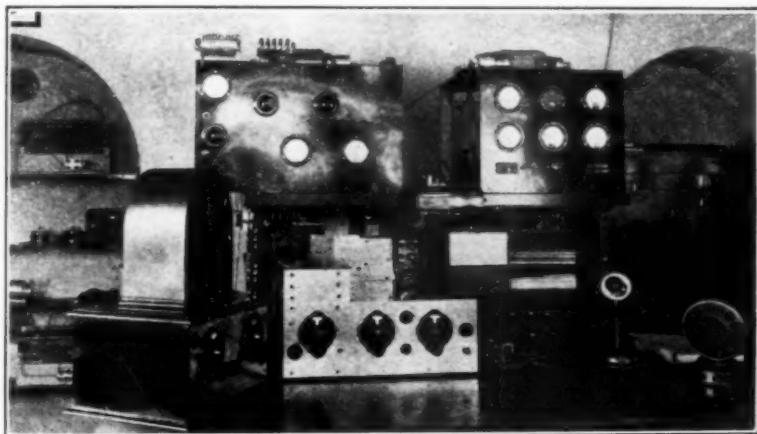
- L_1, L_2, L_3 —Aero plug-in inductances.
- C_1 —7-plate Hammarlund midjet condenser.
- C_2, C_3, C_{13} —.005- μ fd. Sangamo fixed condensers.
- C_4, C_{12} —150- μ fd. Amco variable condensers.
- C_{10}, C_{11}, C_{16} —1- μ fd. by-pass condensers.
- C_{14} —75- μ fd. grid coupling condenser.
- C_{15} —150- μ fd. Sangamo fixed condenser.
- C_{17} —100- μ fd. Hammarlund midjet condenser.
- R_1 —15-ohm fixed filament resistor.
- R_2 —10-ohm fixed filament resistor.
- R_3 —4-megohm grid leak.
- R_7 —0.5-amp. ballast resistor.
- R_8 —12-ohm filament rheostat.
- R_9 —100,000-ohm Centralab variable resistor.
- RFC—High-frequency r.f. chokes.
- B_1 —7.5-volt "C" battery.
- T_3 —All-American audio-frequency transformer.
- J_3 —Telephone jack.

The r.f. tube is a Type '22, the detector a Type '00-A and the audio tube a Type '12-A.

THE AIRCRAFT TRANSMITTER-RECEIVER

The receiver part of the set contains one highly efficient stage of tuned radio frequency, super-sensitive detector, and one stage of audio am-

The receiver sensitivity is considered about the maximum that can be used to advantage in a 'plane where vibration and unbonded metal parts tend to produce considerable QRN. Incidentally, this matter of unbonded metal is a



THE GROUND STATION EQUIPMENT AT W8XB-W8RD

This station is well known to amateurs the world over. The 250-watt c.w. and 'phone transmitter is on the shelf above the operating table. The panel to the left is that of the oscillator and the modulator unit is at the right. The convenient and neat arrangement of the equipment shows careful planning.

plification. Because of the rather restricted space in which all the receiving apparatus had to be installed, some trouble was experienced with excessive feed-back, but this was brought under control after a bit of juggling and the unit now

very important one which should be given closer attention by airplane designers, since any loose metal (not electrically connected to the main mast) is likely to cause serious interference when a sensitive receiver is used and under certain conditions may often modulate the output of the transmitter.

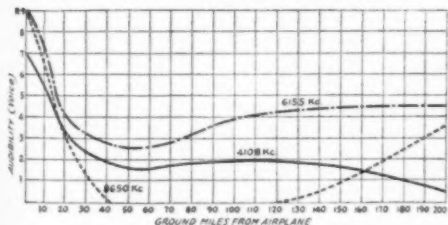


FIG. 2. — AUDIBILITY OF THE 'PLANE'S SIGNALS PLOTTED AGAINST DISTANCE FOR THREE CARRIER FREQUENCIES

The most consistently audible frequency is 6155 kc., the 6050-kc. signals disappearing completely over a considerable range.

operates very smoothly. Change-over from "send" to "receive" is very simple as will be noted by a glance at the diagram given in Fig. 1. In fact, change-over requires only about one second. Plug-in coils are used for both transmitter and receiver.

The complete transmitter-receiver unit (which is thoroughly shielded) is slung between eight sets of rubber bands as a protection against vibration. Such a mounting requires more room than desirable but is necessary if standard apparatus, designed for ground service, is to be used.

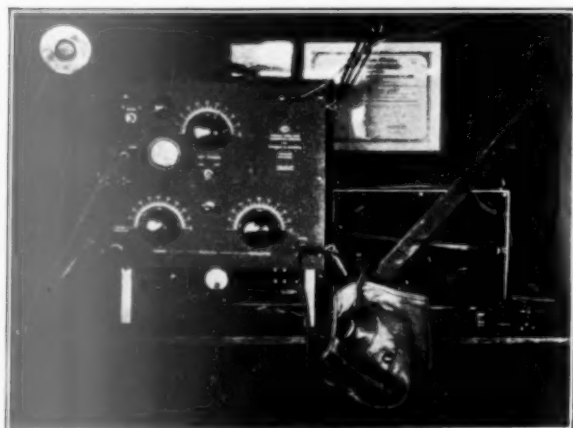
During the past few weeks weather conditions have improved sufficiently to permit considerable flying and sufficient data are now on hand to plot reasonably accurate curves showing comparative efficiency of three different frequencies at an altitude of three thousand feet. These curves are given in Fig. 2. In this connection, although numerous flights of 50 to 250 and one flight of 650 miles and return have been made, it would not have been possible to plot curves at this time except for the coöperation of numerous amateur and experimental stations which have logged our signals from time to time, thus giving a much more complete picture than could have been obtained from the two stations alone. In selecting these coöperating stations the attempt was made to pick out those operated by men who had considerable experience with radiophone communication and which were located at 25 to 350 miles from the ground station. At intervals throughout this period of testing other stations in different parts of the country (but at approximately the same distances) were requested to make observations, thus broadening the field of activity and reducing the chance for error. Other experimental aircraft stations were

coöperated with from time to time by logging signals from their transmitters on similar frequencies.

At present the ground station is using 200 to

retained) drops into these notches, which are easily located by rotating the shaft until the dial shows the approximate position previously logged. To change from one frequency to another, therefore, it is only necessary to slip in the proper inductance; set the tank circuit and antenna condensers; plug in the r.f. choke — and turn on the power. If the frequency meter shows the carrier to be slightly off frequency, a touch on the small tank circuit vernier condenser quickly corrects it. Perhaps satisfaction with this outfit can be expressed best by explaining that it has been operated on five different high frequencies right in a nest of commercials for the past nine months without a single complaint of interference.

So far it has not been advantageous to operate the ground station on one frequency and the 'plane on another, but this might be desirable if the ground station power were increased to, say, one thousand watts, in which case a frequency might be selected that would function satisfactorily both day and night. The aircraft receiver could then be locked to the frequency, with only a small vernier for minor corrections in tuning adjustment.



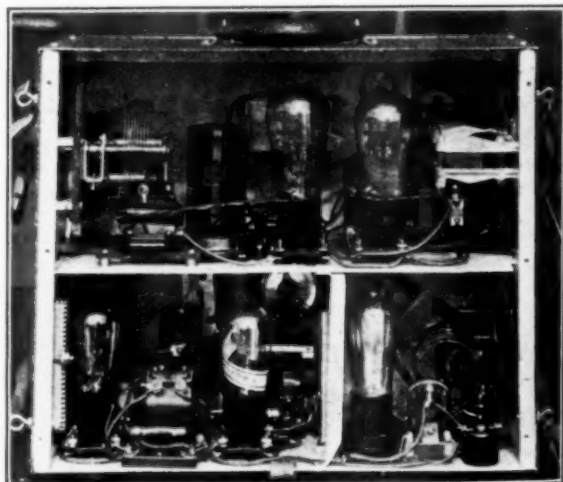
THE 'PLANE TRANSMITTER-RECEIVER INSTALLED IN THE SHIP'S CABIN

The remodeled REL unit is suspended on heavy rubber strands to reduce vibration.

250 watts (modulated approximately 55 percent) and the airplane is using approximately ten watts (modulated approximately 45 percent).

The plate supply for the 'plane transmitter comes from a block of Burgess "B" batteries and the filaments are heated from the regular airplane 12-volt storage battery. As a matter of interest the low power of the 'plane transmitter — although increasing the reception difficulties at the ground stations — has been a real advantage in comparing antenna or frequency results since any tendency to swing or fade is much more noticeable when the voice is just on the verge of understandable audibility.

Both transmitters, for the sake of flexibility, use simple self-excited high-C circuits and the ground station is arranged for quick QSY (approximately 30 seconds) to any previously logged frequency available, thus allowing quick comparisons to be made in the 'plane. Accurate frequency results are obtained on these quick change-overs by making the plug-in inductances very rigid and sturdy. In addition all other parts of the oscillator are mounted in such a way that there can be no vibration. The main Cardwell tank-circuit condenser is provided with an eight-inch disc which has notches cut in its outer edge at the desired positions. A positive lock (spring



THE TRANSMITTER-RECEIVER WITH ITS BACK COVER REMOVED

The transmitter occupies the upper deck, the tube to the left being the oscillator and that to the right the modulator. The compartment at the lower right contains the tuned r.f. stage. The detector and single stage of audio-frequency amplification are in the lower left compartment. Plate and filament power for both units is supplied by batteries.

THE ANTENNAS

The ground station main antenna is a nearly straight wire 340 feet long and 52 feet high at

which are until the previously another, to slip in tank cir- plug in e power. e carrier ouch on ndenser sfaction sed best perated es right he past mplaint

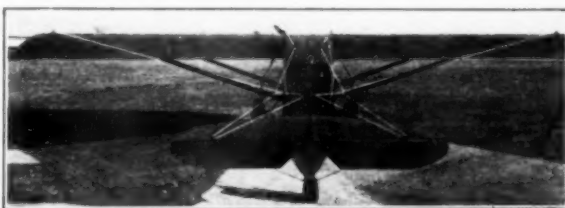
tageous on one another, if the eared which selected ly both eiver ne fre- minor

each end. It is fed in the exact center and operates efficiently on five different frequencies, only one of which requires a loading coil. The airplane antenna used in most of these tests is of the fixed type and gives excellent results both on the ground and in the air.

Just what type of fixed antenna system will prove most successful in the end cannot be predicted at this time, but the doublet type shown in the photograph and Fig. 3 has proven most satisfactory. Fading in particular is at a minimum with this design.

The mounting of a fixed type antenna is quite a problem where planes have been designed without regard to radio. Our method has been to mount a short stub mast, block, or bracket, on the main wing spar as near the end as possible and then lead the wire back toward the tail and

and forward much more closely than good practice dictates, but this method is preferred to the use of loading coils required with shorter an-



THE ANTENNA AND STAY-WIRE ARRANGEMENT ON THE CABIN SHIP

The antenna wire is phosphor-bronze. The lead-in insulators are mounted on the cabin roof between the wings. Fig. 3 illustrates the antenna arrangement schematically.

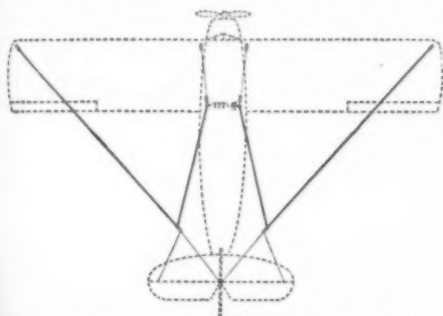


FIG. 3. — DIAGRAM OF THE DOUBLET TYPE ANTENNA USED ON THE STINSON-DETROITER CABIN PLANE

Stay-wires are useful in preventing excessive vibration of the antenna wire and also take the mechanical strain off the lead-in insulators.

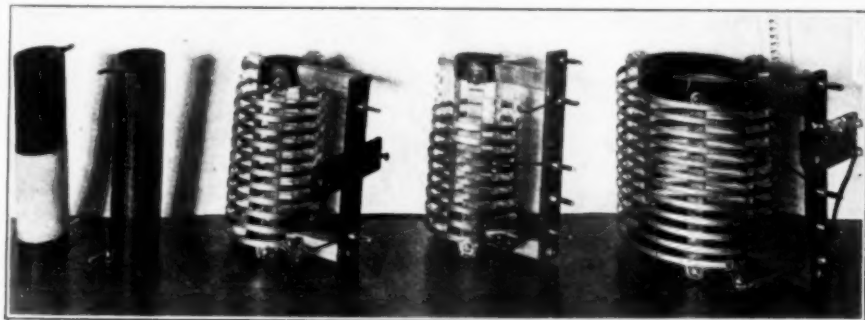
forward to the Pyrex bowl insulators which carry thru to the interior of the cabin. If the wings are

tennas. Unless the cabin roof is quite strong where the lead-in bowls go through, it will be necessary to provide strain wires and insulators to carry the load. Such an arrangement is illustrated.

Copper wire cannot be used, of course, and copper clad steel seems to break too easily after a kink. Phosphor bronze, however, makes a good job which will stay tight for thousands of miles, providing the natural period of vibration of the wire doesn't happen to coincide with that of the propeller blast or slip stream. It is a good idea to provide a turnbuckle at the rear end for take-up.

Trailing type antennas have been tried at various times and proven themselves absolutely unsuited to high-frequency work. In addition to the difficulty of putting out a steady signal from such a radiator, reception has always been accompanied by extreme fading, and the constant danger of losing a "fish" while over a thickly populated territory makes pilots almost unanimous in opposing such a device.

Short vertical antennas of the type now used for weather report and beacon signal reception



SOME OF THE PLUG-IN INDUCTANCES FOR THE 250-WATT TRANSMITTER

The necessity for rapid and accurate frequency changes is met by inductances of this type. Note that the plugs are connected in pairs wherever required to carry heavy r.f. current.

short, in obtaining the required antenna length it may be necessary to have the wire run back

might be used with less directive effect, but the inefficiency of such a radiator would certainly

OVER

ing the e lower audio- and fil-

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call for a great deal more power than we have been using.

The ground station receiver most generally

from the airplane while the ship was flying at approximately 3000 feet. The photographs show the airplane, the ground station and some details

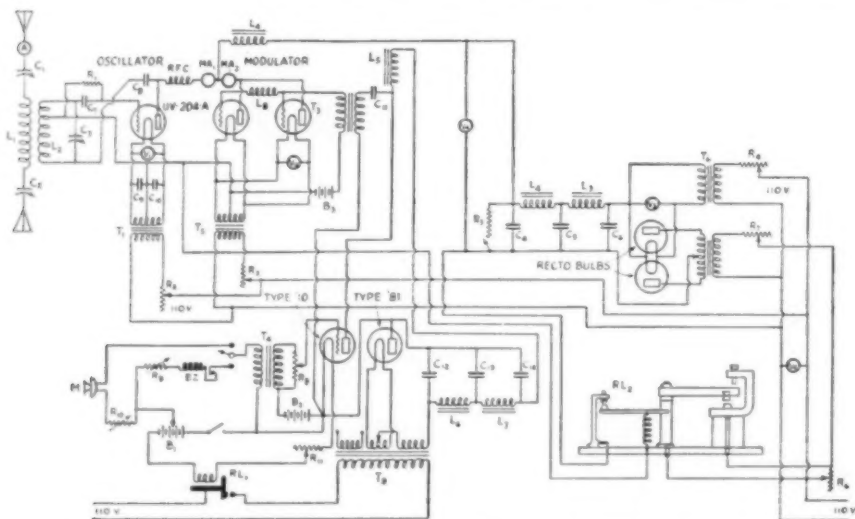


FIG. 4—THE CIRCUIT OF THE 250-WATT GROUND-STATION TRANSMITTER, W8XB-W8RD

A — 0 to 3-ampere thermo-ammeter.
 B₁ — 8-volt storage battery with 6-volt tap.
 B₂ — 35-volt "C" battery.
 B₃ — 78-volt "C" battery.
 C₁ — 500-μfd. antenna series condenser.
 C₂ — 500-μfd. antenna series condenser.
 C₃ — 650-μfd. tuning condenser.
 C₄ — 6-μfd. 2000-volt fixed condenser.
 C₅, C₆ — 2-μfd. 2000-volt fixed condensers.
 C₇, C₈ — 2000-μfd. 5000-volt mica-insulated condensers.
 C₉, C₁₀ — 2000-μfd. 2000-volt mica-insulated condensers.
 C₁₁ — 1-μfd. 1000-volt condenser.
 C₁₂ — 2-μfd. 1000-volt condenser.
 C₁₃ — 2-μfd. 600-volt condenser.
 C₁₄ — 4-μfd. 600-volt condenser.
 L₁, L₂ — Flat-wound plug-in type inductance.
 L₃ — Choke, 30-henry 300-milliamperes.
 L₄ — Choke, 30-henry 500-milliamperes.
 L₅, L₆, L₇ — Choke, 30-henry 80-milliamperes.
 L₈ — 18 turns, No. 30 d.s.c. wire on 1" tube.
 MA₁, MA₂ — 0-300 d.c. milliammeter.

R₁ — 200-watt 11,000-ohm tapped resistor.
 R₂, R₃, R₄ — Allen-Bradley type 210 Radio-stats.
 R₅ — 200-watt 20,000-ohm resistor.
 R₆ — 80-watt 20-ohm rheostat.
 R₇ — 200-watt 80-ohm rheostat.
 R₈ — 500,000-ohm potentiometer.
 R₉ — 50-ohm rheostat.
 R₁₀ — 200-ohm rheostat.
 R₁₁ — 6-ohm rheostat.
 RL₁ — 6-volt switch-relay.
 RL₂ — Double-contact relay.
 RFC — Radio-frequency choke coil.
 T₁ — 150-watt filament transformer.
 T₂ — 1-kw. 2200-volt plate transformer.
 T₃ — Audio transformer.
 T₄ — Acme A-3 microphone transformer.
 T₅ — 150-watt filament transformer.
 T₆ — 150-watt filament transformer.
 T₇ — Filament and plate transformer.
 V₁, V₂, V₃ — 0-15 a.c. voltmeter.
 V₄ — 0-2000 d.c. voltmeter.
 V₅ — 0-150 a.c. voltmeter.

used contains two ganged stages of tuned radio frequency, a super-sensitive detector, and two stages of audio feeding a loud speaker through the usual output filter. Headphone reception may be had (with either one or two stages of audio) by throwing a switch. The extra receiver uses one Type '24 as a coupling tube from antenna to super-sensitive detector, with two stages of audio. Fixed capacities of different values may be placed in parallel with the tuning capacity by rotating a seven point switch, thus greatly increasing the tuning range of this receiver.

The curves shown are for average field strength (as judged by audibility) at different distances

of the 'plane's transmitter-receiver. The schematic diagrams cover the circuits used.

As yet, we have very little data on night flying but it seems safe to predict that the same or better results can be obtained at night with frequencies around 3000 kilocycles. In plotting the curves, the old amateur "R" system has been used to indicate audibility since it seems more suitable in this case than the new "QSA" system.

To sum up: daylight airplane radiophone communication seems reasonably practical and reliable on frequencies between 4500 and 6000 kilocycles at distances up to 200 miles or more.

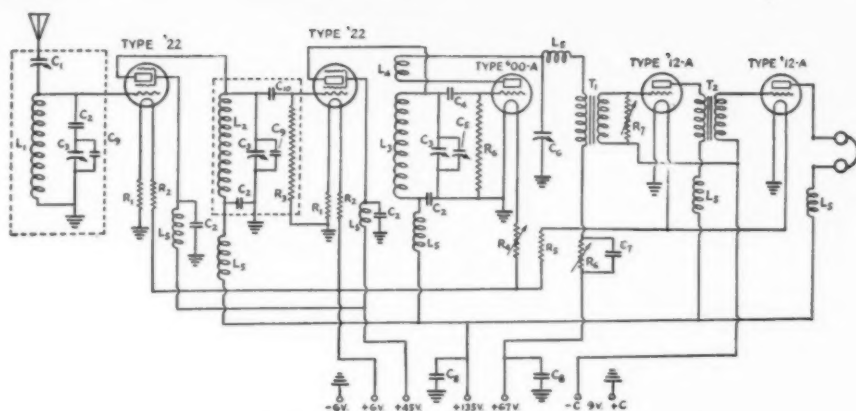


FIG. 5. —WIRING DIAGRAM OF THE RECEIVER AT W8RD-W8XB

- | | |
|--|--|
| C_1 — 65- μ fd. coupling condenser. | L_5 — Radio-frequency choke coils. |
| C_2 — 5000- μ fd. fixed condenser. | R_1 — 10-ohm fixed resistor. |
| C_3 — 150- μ fd. tuning condenser. | R_2 — 15-ohm fixed resistor. |
| C_4 — 150- μ fd. grid coupling condenser. | R_3 — 1- to 10-megohm grid leak. |
| C_5 — 100- μ fd. balancing condenser. | R_4 — 20-ohm rheostat. |
| C_6 — 250- μ fd. regeneration control condenser. | R_5 — 0.5-ampere ballast resistor. |
| C_7 — 1- μ d. by-pass condenser. | R_6 — 50,000-ohm variable resistor. |
| C_8 — 5- μ d. by-pass condenser. | R_7 — 1- to 10-megohm volume control. |
| C_9 — 45- μ fd. trimmer condenser. | T_1 — 6 to 1 audio transformer. |
| C_{10} — 175- μ fd. coupling condenser. | T_2 — 3 to 1 audio transformer. |
| L_1, L_2, L_3, L_4 — Aero plug-in tuning coils. | "Grounds" indicate connections to shielding. |

It is my opinion, however, that the airplane transmitter should have an output of approximately 100 watts and the ground station 250 to 1000 watts, both with a fairly high percentage of modulation. To obtain desirable frequency stability, self-controlled or crystal-controlled oscillator-amplifier circuits should be best for the airplane transmitter and the ground station should also be crystal controlled.

Our results have been much easier of attainment because the Packard-Diesel engine (with which the 'planes have been powered) produced no ignition disturbances to complicate the job. Planes powered with gasoline engines would require very complete shielding of the ignition apparatus, including magnetos, wiring and spark plugs, if similar results were to be expected.

He is a graduate of Drexel Institute and a *bona fide* amateur by every test.

Mr. Clyde J. Houldson, W1AKW, of Springfield, Mass., inherits the Information Service in succession to Mr. Grammer. Mr. Houldson joins us from Westinghouse. A graduate of Morton College, he is an Illinoian by birth, having operated 9DQB and 9EDM in Mt. Carmel and the last-named call in Chicago, too.

As the cause of these changes, we regret to announce the resignation of Mr. Beverly Dudley, our assistant technical editor, to become assistant secretary of the Institute of Radio Engineers. Of course whenever the I.R.E. runs out of secretaries it comes up to Hartford and looks over the best radio aggregation in semi-captivity. John Clayton and Harold Westman were both formerly QST men. With Clayton's recent resignation from

(Continued on page 72)

Staff Changes

WE have pleasure in announcing the appointment of Mr. George Grammer, W1DF, as assistant technical editor of QST. Mr. Grammer, formerly W3AIH at Audubon, N. J., joined the headquarters staff last fall to take charge of the A.R.R.L. Technical Information Service. In the intervening months not only has he written the usual number of "how-many-turns" letters to members but he has found time to write several very helpful articles for our pages, so he comes as no stranger to our readers.

Strays

WSAHN suggests that for low loss construction where a glass base "board" is used, rubber vacuum feet such as those used on cigarette ash trays for automobiles could be used to mount coils, and condensers on the glass. This would eliminate drilling the glass, and would enable the experimenter to change the circuit or arrangement of parts at will.

Our Regulations Are Revised

Commission Revision Solidifies Our Position—Improved Plate Supplies Required—28-mc. Band Made Exclusively Amateur—Compulsory Logs

By K. B. Warner, A.R.R.L. Secretary-Editor

THE United States amateur regulations have been revised by the Federal Radio Commission, effective April 5th. For the first time we have a complete set of regulations which proceed in orderly and logical fashion under the 1927 law. We have now, we believe, a better and more understandable set of regulations than exists for any other class of stations in this country. In the revision, much has been done to clarify language and to make more exact specifications. There are also now introduced into the regulations many minor specifications which previously had been covered by special instructions of some sort but never codified and included in the actual "regs" themselves.

FEW CHANGES

There are few changes of importance. The most important one is the requirement that all amateur stations use adequately-filtered d.c. supply or arrangements such that inferior supplies will not produce "wobblulation." We shall discuss this in detail later. The 28- to 30-mc. and the 56- to 60-mc. bands are made exclusive amateur assignments in this country, which is a big gain. Station logs are made compulsory. Quiet hours are better defined. In fact it may be said that the big merit of the new regulations is the definiteness with which they outline the whole field of amateur radio in this country. The older regulations contained many phrases which were subject to varying interpretation and which in fact were variously interpreted in many quarters. Much of the regulation of amateur radio was simply "agreed practice," never formally reduced to writing, and there has been considerable lack of uniformity in enforcement in the different districts. The new text, it may be hoped, will go far in overcoming these faults.

HOW IT HAPPENED

The authorities at Washington have felt for some time the necessity for overhauling our regulations, but pressure of duties has delayed the job until recently. On March 21st the Commission held an informal conference on the subject at Washington, primarily between its legal and engineering divisions, the Radio Division of the Department of Commerce, and the American Radio Relay League, but also attended by

many others. (See this month's editorials, written before the adoption of the new regulations.) Mr. W. D. Terrell, chief of the Radio Division, presided at the request of the Commission, and A.R.R.L. was represented by Mr. Charles H. Stewart, its vice-president, Mr. Paul M. Segal, its general counsel, and the writer, its secretary. After a full day of discussion the major features were agreed upon, and the following week a drafting committee, on which we were also represented, undertook to reduce the agreements to formal writing. The finished document is largely the work of Mr. Arthur W. Scharfeld of the legal division of the Commission.

THE TEXT

The conference's work was then reported to the Commission by Mr. Terrell, and the Commission by a general order set aside its previous amateur orders and substituted the new regulations. And there we are.

We now present the complete text of the new regulations, which are *now in effect*, and follow it with a discussion of the intention and effect of the various provisions.

REVISED AMATEUR REGULATIONS

Under the provisions of Section 4 of the Radio Act of 1927, as amended, the Federal Radio Commission establishes the following regulations for amateur radio stations:

Section I. *Definitions:* As used in these regulations,

- (a) An amateur is a person interested in radio technique solely with a personal aim and without pecuniary interest;
- (b) An amateur operator is a person holding a valid license from the Secretary of Commerce as a radio operator who is authorized under the regulations of the Secretary of Commerce to operate amateur radio stations;
- (c) An amateur station is all the apparatus controlled from one location used for amateur radio communication;¹

¹ As a matter of licensing procedure, in all cases of remotely-controlled transmitters the location of the station shall be assumed to be that of the control point, save that where such control point is more than five miles from the radiating antenna the location shall be assumed to be that of the radiating antenna.

- (d) Amateur radio communication is radio communication between amateur radio stations by telegraph, telephone, facsimile, or television solely with a personal aim and without pecuniary interest;
- (e) A fixed station is a station permanently located;
- (f) A portable station is a station so constructed that it may conveniently be moved about from place to place for communication and is in fact so moved about from time to time, but not ordinarily used while in motion.
- (g) A mobile station is a station permanently located upon a mobile unit and ordinarily used while in motion.

Section II. Classification of Amateur Stations:
The public interest, convenience and necessity will be served by the operation of amateur stations. Save as restricted by and subject to the provisions of, treaty, law or regulations of the Commission and with the exception of individual cases where the public interest, convenience or necessity requires otherwise, all applications from amateurs for amateur station licenses will be granted.

Section III. Prescription of the Nature of Service to be Rendered:

- (a) For the present, amateur mobile stations will not be licensed.
- (b) Amateur stations are to communicate only with similar stations. In emergencies or for testing purposes they may communicate with commercial or government stations. They may also communicate with mobile craft and expeditions which do not have general public service licenses and which may have difficulty in establishing communication with commercial or government stations.
- (c) Amateur stations shall not broadcast news, music, lectures, sermons, or any form of entertainment to the general public.
- (d) Amateur stations shall not transmit or receive messages for hire nor engage in any communication for material compensation, direct or indirect, paid or promised.
- (e) Except as otherwise herein provided, amateur radio stations shall be used only for amateur radio communication, as defined in Section I, paragraph (d) above.

Section IV. Assignment of Bands of Frequencies:

- (a) The following bands of frequencies are assigned exclusively to amateur stations:

1,715 to	2,000 kilocycles
3,500 to	4,000 "
7,000 to	7,300 "
14,000 to	14,400 "

28,000 to	30,000	"
56,000 to	60,000	"
400,000 to	401,000	"

- (b) All bands of frequencies so assigned may be used for continuous wave telegraphy.
- (c) The following bands of frequencies may also be used for radio telephony:

1,715 to	2,000 kilocycles
3,500 to	3,550 "
56,000 to	60,000 "
- (d) Upon application, amateurs who hold operators' licenses from the Secretary of Commerce of the Extra First Class Amateur grade, or higher, or who show special technical qualifications, satisfactory to the licensing authority, will also be licensed for radio telephony in the band of frequencies:

14,100 to	14,300 kilocycles
-----------	-------------------
- (e) The following bands of frequencies may also be used for television, facsimile and picture transmission:

1,715 to	2,000 kilocycles
56,000 to	60,000 "
- (f) Licenses to individual amateur stations shall permit the use of all frequencies within the service bands above assigned which the licensee may be entitled to use and shall not specify individual frequencies.

Section V. Location: An amateur radio station shall not be located upon premises controlled by an alien.

Section VI. Regulations Concerning the Kind of Apparatus to be used with Reference to its External Effects:

- (a) Amateur stations shall not use apparatus transmitting damped waves.
- (b) The frequency of the waves emitted by amateur stations must be as constant and as free from harmonics as the state of the art permits. For this purpose they must use circuits loosely coupled to the radiating system or devices that will produce equivalent effects to minimize keying impacts and harmonics. Conductive coupling to the radiating antenna, even though loose, is not permitted but this restriction does not apply against the employment of transmission-line feeder systems to Hertzian antennas.
- (c) Amateur stations must use adequately filtered direct current power supply or arrangements that produce equivalent effects to minimize frequency modulation and prevent the emission of broad signals.²

²E.g., the use of unrectified alternating current power supply will be considered satisfactory in the amplifier stages of an oscillator-amplifier transmitter so arranged that variations in plate voltage cannot affect the frequency of the oscillator.

- (d) Amateur stations are authorized to use a maximum power input into the last stage of a transmitter of one kilowatt.

Section VII. Regulations Deemed Necessary to Prevent Interference:

- (a) In the event that the operation of an amateur station causes general interference with broadcast reception on receiving apparatus of modern design, that amateur station shall not operate during the hours from eight o'clock p.m. to ten-thirty p.m., and on Sundays from ten-thirty a.m. until one p.m., local time, upon such frequency or frequencies as cause such interference.
- (b) An amateur station shall transmit its assigned call at the end of each transmission but in any event at least once during each fifteen minutes of operation.

Section VIII. Other Regulations:

- (a) Amateur station licenses shall be issued only to persons who are amateurs, as defined in Section I, paragraph (a) above.
- (b) Amateur station licenses shall be issued only to persons who are amateur operators, as defined in Section I, paragraph (b) above, provided, however, that if an applicant is not such an operator, an amateur station license shall be issued him upon the presentation of affirmative evidence that the station, when licensed, will be operated by an amateur operator.
- (c) Amateur station licenses shall not be issued to corporations or associations, provided, however, that in the case of a bona fide amateur radio society, a license may be issued to an authorized official of such society as trustee therefor.
- (d) The licensee of a portable station shall give advance notice to the Supervisor of Radio in the district where application was made for said portable station license, of all locations at which the station will be operated.
- (e) The licensee of an amateur station shall keep an accurate log of station operation, in which shall be recorded the time of each transmission, the station called, the input power to the last stage of the transmitter, and the frequency band used.

Section IX. Administration: For the purpose of administering these regulations and under the findings of public interest, convenience and necessity herein made, all ministerial and routine duties in connection with the licensing of amateur radio stations will be performed by the Radio Division of the Department of Commerce. That Division will issue, on behalf of and in the name of the Commission, all licenses, the applications for which disclose no question involving discretion

and which require no determination of controverted questions of fact. All applications tendering such questions shall be referred by the Radio Division to the Commission.

EXAMINING THE REGS

Let us now examine our new regulations and see what their effect is.

Section I starts off with definitions. Important as this is in any set of regulations, in ours the definitions are particularly important because of the protection they give us. They establish our status definitely. An amateur is this particular kind of a person, and his communication is of the type defined. Other people who have not this interest may not obtain the right to our privileges. We are definitely protected against invasion by commercials who might seek amateur licenses, for they have not "a personal aim" and on the other hand are not "without pecuniary interest."

A distinction is made between an amateur and an amateur operator to fit in with the licensing regulations in *Section VIII*.

There is much confusion in other branches of radio as to what constitutes a "station." In the commercial world each transmitter is frequently considered a separate station and given a call of its own. It became questionable whether amateurs had the right to build separate transmitters for different bands. Paragraph (c) disposes of this and makes one station out of all the apparatus controlled by one amateur—in 999 out of a thousand cases. Note 1 covers the other case. An amateur station must be identifiable, in case of interference—its call must indicate its location. If one transmitter of a multiple-transmitter amateur station were too far away it might create entirely different interference conditions not identified with the remainder of the apparatus. Thus Note 1 has a twofold effect. If a single transmitter is controlled from a distance of over five miles, the location of the station is specified as that of the radiator; otherwise it is specified as that of the control point. If a station has one or more transmitters close by and one controlled over a distance of five miles or more, the ones close by constitute one station, with one call, with its location that of the control point, while the distant transmitter becomes known as another station and must be the subject of a separate license, with another call to identify it and distinguish it (because of its separation) from the other transmitters.

Section II. The Commission is forbidden by law to issue any license not found to be in the public interest, convenience or necessity. To avoid holding a special hearing on every amateur application, the Commission here reaffirms its present policy of declaring that the granting of licenses to bona fide amateurs is in the public

interest, convenience or necessity, and that in the absence of exceptional circumstances the license will issue.

Section III. The first paragraph of this section, denying licenses to amateur mobile stations, is nothing new; they have never been licensed. A few amateurs owning yachts have sought such a license but always, so far as we know, for more or less utilitarian communication and hardly because of interest in radio technique. If the bars were ever let down we would be invaded by hordes of non-amateur boat owners who would represent themselves as amateurs in order to obtain utilitarian private communication for themselves. It would swamp us. For instance, in the port of New York alone there are small power-driven pleasure craft registered to the number of 32,000! This would not be a bona fide amateur use, and the present regulation protects us. Where a small private craft has need for radio, it may hope to obtain a marine license to use the h.f. marine channels; the Secretary of Commerce has discretion to permit the operation of such apparatus under an amateur operator's license; and Section III (b) would permit such craft to communicate with amateurs.

Amateurs should draw a careful distinction between mobile and portable stations. See paragraphs (e), (f) and (g) of Section I. Portables are still to be licensed, but may not be used while in motion. If amateurs rigged a station on an automobile, as the Podunk Hollow Radio Club did on our last cover, they may obtain a license for it as a portable station, to operate while not in motion and at fixed locations previously reported as required in Section VIII (d), but they may not obtain a license to operate while in motion because there are no amateur mobile stations.

Paragraph (b) is a rewording of a similar old paragraph, with clarification of the language. Paragraph (c) is an old friend. Paragraphs (d) and (e) define the kind of communications that may be handled and, while giving further protection against commercial enterprises masquerading as amateurs, put in much plainer language the accepted prohibition of compensation by amateurs and eliminate the misunderstandings which always surrounded the old language.

In **Section IV** there is nothing new except the important fact that the bands 28,000 to 30,000 kc. and 56,000 to 60,000 kc. (our 10-meter and 5-meter bands) are now assigned exclusively to amateur stations instead of jointly to amateur and experimental stations. There is plenty of space in this part of the spectrum. There are only a couple of non-amateur licenses in existence for these bands, and they are temporary. The telephony assignments have been repeated without change.

Section V is a new regulation. Aliens are denied

station licenses, and it is plainly the intent of the basic law to prevent their control of a station. The law has been circumvented in the past, occasionally, by organizing a club and having the club station located in the home of its alien organizer who, as an operator, then enjoyed all the privileges of a citizen. The new regulation must be regarded as in accord with the Radio Act.

In **Section VI**, paragraph (a) prohibits the use not only of spark but of all other forms of Class B waves "consisting of successive trains in which the amplitude of the oscillations, after having reached a maximum, decreases gradually." (I.R.C., 1927.) Although the use of "continuous waves modulated at audible frequency" (Type A2) is not barred by this paragraph, it does definitely prohibit *interrupted c.w.* ("I.C.W.") as obtained by chopper or buzzer or any other mechanical method of interrupting a radio-frequency circuit.

Paragraphs (b) and (d) represent no change from existing practice. Paragraph (c) and its attending Note 2, however, are a departure and an important one. Their intent, in general, is to do away with a.c. signals and substitute d.c. signals for them. In the case of self-excited transmitters it will take a d.c. power supply to do this, in almost every case. Ingenuity must not be stifled, however, and if an amateur can show, for example, that he has a new-fangled tank-circuit arrangement of his own which, although supplied with a.c., is free of "wobulation" and produces a d.c. signal modulated at the supply frequency instead of producing the usual infamous "spray" of frequencies, he will be permitted to use it. This is admittedly an extreme case. In general, it is only oscillator-amplifier transmitters (crystal-controlled or self-excited oscillators) that can hope to get under the wire and be permitted to use a.c. plate supply, and even they only under the provisions (1) that they have a buffer stage so that the changing plate voltage on the amplifier has no opportunity to get back into the oscillator and affect its frequency and (2) that the oscillator and buffer stage are, of course, fed with d.c. Putting all of this into ham language, modulated signals are still permitted but "wobulated" signals are now prohibited, and the transmitter which uses other than d.c. supply must be built like a good 'phone set.

It is high time that we had such a regulation. Every other country which licenses amateurs has long had such a requirement, but we in North America have merrily continued with the selfish signals that eat out great chunks of the band. And we the most numerous, the most congested! There has been much amateur agitation the last two years to oblige the selfish signal to take a course of treatment and transform itself into what was first known as a "1929 signal." When spark finally went, years too late, there were still a few disappointed lads, and we suppose there will be a

few who will object to making the effort to better their plate supplies. It must be done, though, for our own good—that is the overwhelming majority sentiment of the League.

Barring the use of a.c. on the amplifier stages of oscillator-amplifier transmitters, or similar arrangements, every power supply must now have a filter, even the motor-generator supply, although of course it won't take a large filter for that. The chap with a rectifier but no filter must add the filter. The owner of a self-excited transmitter using "raw a.c., self-rectifying" is under the obligation of installing both a rectifier and a filter or of making some other provision for d.c. The owners of "full-wave back-to-back self-rectifying" a.c. transmitters would probably be best advised to provide a d.c. supply and convert the oscillator to push-pull at radio frequency, a rather simple constructional job—unless they can demonstrate to the Supervisor that they have one of those possible but extremely rare jobs where "wobulation" is practically absent. The owners of "1929 type" transmitters with d.c. supplies have nothing to worry about.

Section VII contains a much more definite statement of the silent-period regulation than we have had in the past, although making no change from the accepted interpretation of it. It remains impossible, of course, to state minutely in regulations just when quiet hours must be observed. The terms "general interference" and "modern design" express the desired thought, but, unfortunately, are still subject to human interpretation. It should be noted that when a Supervisor of Radio informs an amateur that he should observe quiet hours it is not because the Department of Commerce has authority to fix the hours of operation (for it has not), but because this paragraph (a) is a Commission regulation which becomes operative if and when general interference ensues. The Supervisor informs the amateur of the fact; the provision then applies. If the amateur and the Supervisor disagree on the facts, only a Commission hearing can properly decide the case. Fortunately this is an academic issue nowadays.

One big improvement in this regulation is the definite specification of the Sunday morning silent period (when one must be observed) as from 10:30 a.m. until 1 p.m. The old regulation said "Sundays during local church services." In some cities, what with early masses and afternoon services, church services are in progress all day long. Obviously the regulation cannot refer to local broadcasting. Its intent is to give special protection to religious broadcasts for people who desire to worship thereby instead of attending church in person, and the present wording extends such protection during the hours that persons normally assemble for worship. The evening silent period applies on Sunday too, of course, for stations which have the quiet-hours obliga-

tion. It should be noted that if one frequency band causes local interference but another band does not, the station remains free to operate on the bands that do not cause interference, or even on the other end of the same band if interference is thereby avoided.

Paragraph (b), about signing, is a logical provision. All stations are under the obligation of indicating their identity frequently.

In Section VIII the first two paragraphs are further protection to us that the right to the amateur bands shall be extended only to amateurs and used only for amateur purposes. Paragraph (b) solves a troublesome problem in a satisfactory way which is self-explanatory. In pursuance of this same thought of protection it has been necessary, in (c), to provide that club licenses must also be issued to individuals as trustees for the club. Club licenses in the past have all too frequently been blinds for persons who were not entitled, as individuals, to station licenses. A bona fide amateur club owning an amateur station will have no difficulty in securing a license, but some official must be delegated to assume full responsibility under the law for the station's operation. Examples: WIMK, F. E. Handy, Communications Manager, trustee for American Radio Relay League, Brainard Field, Hartford, Conn.; W9ABCD, John K. Smith, President, trustee for Sunflower Radio Club, 98 S. Main St., Sumwarin, Kansas. Listings in the call book will thus properly show that the station is the station of a society and not individually owned.

Paragraph (d) has the effect of wiping out the old Department of Commerce regulations establishing two kinds of portable stations and provides that every portable station must confine its operation to points for which an itinerary has been filed in advance with the home Supervisor. The Government, of course, has every right to know the location and identity of every transmitting station.

Partly in this vein and partly because every station ought to do it anyhow, paragraph (e) makes compulsory the keeping of a simple station log. The Radio Act requires that the records of a station must be made available to the radio authorities upon demand. The log, then, becomes available to the Supervisor in investigating interference cases, etc., and will assist in showing what frequencies and what powers interfere, what do not, and so on. Note that the input power (to the last stage of the transmitter) must be specified for every transmission. This is a compromise provision. Some of the Government people believed that amateurs should keep an accurate description of their station on file, reporting every change; some even believed that a new application should be filed for every important change. We felt that the amateur station should

(Continued on page 72)

International Communication on 28 Megacycles

New Records Set Up—All Continents Active—Excellent Reception
—Foreign Stations Crave More U. S. A. Activity

By Clark C. Rodimon, Assistant Editor

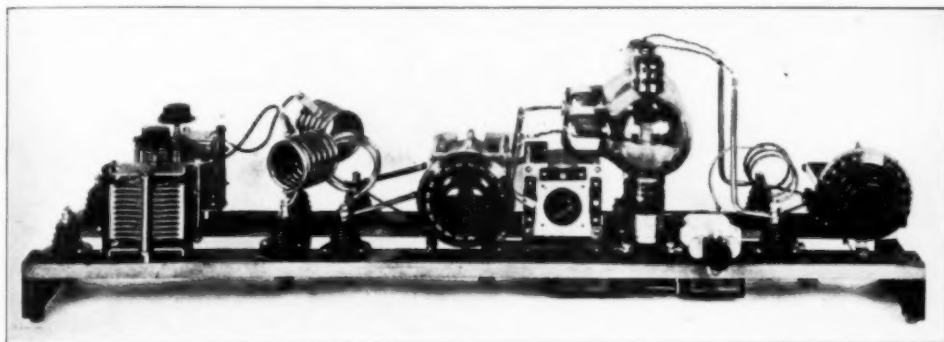
THE heretofore dormant 28-megacycle band has certainly been strutting forth since the first of the year and rewarding all those who have been active on that band.

Ross Hull and Jim Lamb came back from Wianno, Cape Cod, Mass., last year after experimenting with beam antennas at W1CCZ, with thrilling tales of signal strength unheard of on any other frequency. They had a circuit open with W6UF, 2500 miles away, that was sure-fire from 9:15 a.m. until 4 p.m.—seven hours of

GREAT BRITAIN

The R.S.G.B. sponsored tests during four week-ends in March, and at this time we are awaiting details on the work that was done.

Many British stations have been active, and among the most notable are: G5ML, G6LL, G5WK, G6NF, G2OD, G6QZ, G5BY, G5DH, G2CJ and BRS25. These stations, with the exception of BRS25, have been heard in this country and most of them have been worked. W2NM, W2JN, W9BYC, W1BJD, W1AQD, W9EF,



A 150-WATT 28-MC. TRANSMITTER IN DEVELOPMENT AT A.R.R.L. HQ.

This transmitter, which will be described in detail next month, has several novel circuit features. During the tests it will be used in conjunction with a directive antenna. This is only one of the transmitters that will be operated on 28 mc. here in Hartford.

contact with no interference of any sort and extremely loud signals at both ends. The work at W1CCZ of necessity had to close down after a week of experimentation.

Until just recently 28 megacycles has been holding forth its laurels to mighty few stations, notably W2JN in this country. Since the first of the year stations in U. S. A. have worked back and forth; Europe has worked Africa, U. S. A., and is testing with Australia, besides working various countries within European boundaries; China has contacted with Australia and heard U. S. A. signals; W stations have heard and worked all continents with exception of Asia. However, this should be gone into in detail and we shall record what has been digested from reports received.

W8AXA, W2ACN, W2BG, W1COW and W2AIS have been reported more than once in England. W9BYC, in Colorado, seems to be the best DX the British stations have heard from U. S. A. A few PY stations are reported.

G5WK contacted ZS5C and ZS4M for first contact on 28 mc. between England and South Africa.

FINLAND

OH2NM, with a crystal-controlled transmitter of 20 watts input, worked FM8GKC and FM8BG, in North Algeria, Africa. OH2NM has also worked ZS4M. OH2NV, OH2OP, OH1NH and OH1NT are other active stations in Finland.

DENMARK

OZ7Y and OZ7T are both active, 7Y being

reported by many U. S. A. stations. ZS4M worked 7T for the first Danish-South African QSO. 7Y was QSO W2JN on New Year's Day for first W-OZ contact.

FRANCE

About the only active station that we know of in France is F8CT. F8CT has worked W2JN frequently.

SOUTH AFRICA

ZT6K, ZS4A, ZS4M and ZS5C seem to be the active stations in S. A. ZS4M has done excellent work, being reported by many stations in Europe as well as Eastern and Central U. S. A. 4M holds the honor of first ZS-OZ, W-ZS and ZS-G (shared with 5C) contacts. Mighty fine work, OM Hill. Extracts of a letter from ZS4M, Mr. C. H. Hill, 4 Fischer Street, Bloemfontein, Orange Free State, South Africa, to W2JN (who was the W

we rebuilt entirely, this time using 50 watts. We reckon this was the most efficient transmitter we had constructed so far. In this test we used a single-wire voltage-feed antenna and theoretically speaking everything was just 'it.' Still ND.

"About this time our friend ZS5C had his first QSO on low power, so we did our best with a 1929 Hartley using 20 watts and with a twin-feed Zepp. (This twin-feed Zepp Mr. Hill is referring to we think is what we term a regular Zepp feeder or 2-wire feed. — *Editor.*) Once again, ND.

"You can see that we have reduced power each transmitter. We decided that it would be in order to QRO. Accordingly we converted our 250-watter (20-meter transmitter) into a 10-meter transmitter and hit the breeze. Still ND, and no reports.

"However, we were not beat yet, as we still had the 500-watter in reserve. Hi! About a fortnight ago we decided to convert our big noise to ten and see if anything doing. (Looks as though the 40-meter transmitter is about to lose its bottle of r.f. energy. — *Editor.*) So our 40-meter transmitter was partly dismantled and away we went, but again ND. (Things must have looked desperate at this stage of the game with nary a workable transmitter at ZS4M. — *Editor.*)

"Considerable thought led us to the conclusion that we must be suffering from resistance losses to and in the aerial, so the last day in 1929 we scrapped all our experimental antennas, numbering about five in all, and set to work to construct something solid — and here's the dope.

"The aerial proper consists of $\frac{3}{8}$ " diameter copper tubing 16 feet long. This is fed by a single copper tube $\frac{1}{4}$ " diameter and about 10 feet long, firmly soldered onto a 2-turn coil made of $\frac{3}{8}$ " copper tubing. Practically all leads to the transmitter are of heavy copper tubing, so we reckoned we had minimized resistance losses. We listened locally and the signal emanating from this antenna was very strong. We listened as far away as ten miles, and the strength of the signal was still r9. This was good enough, and we decided we were ready for the fray. That we were not wrong was conclusively proved yesterday when we broke all records, first by two QSO's in one day and then second by working W2JN in America."

Isn't that a story of real perseverance without a single spark of encouragement in the way of reports? We know that ZS4M is going to be a busy station week-ends from now on — and he certainly rates it. The power input at this station is 700 watts and it has been reported r7 by W2JN.

CHINA

Rodman, former AI2KT, has located in China. Old AI2KT made many W stations "Wackers," and when it was dismantled we missed a fine Asian contact. Then we start hearing a call "XU2UU" on 28 megacycles. It is from China, and is the station of Rodman, who has been

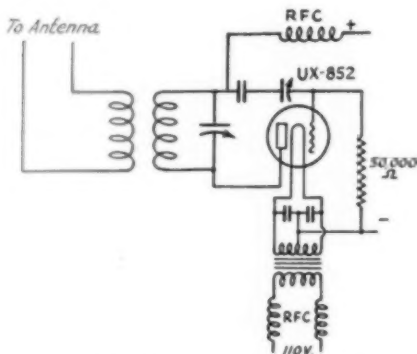


FIG.1 TRANSMITTER USED AT W6BAX

station in the first ZS-W contact) explains the discouragements that were encountered at the South African end. This will interest those of us who have failed first crack. We are quoting part of Mr. Hill's letter:

"I want to say that practically all the credit for performance of ZS4M belongs to ZS4E who built, designed and perfected this station. We commenced our work on ten meters about the beginning of 1929 with a bread-board hay-wire transmitter. The aerial used was a horizontal full-wave Hertz and we kept going on this for two months, and as we neither were heard, nor heard anything, we scrapped it and rebuilt.

"This time we had a very FB transmitter using a twin voltage-feed Zepp, but again ND.

"We stuck to this for some months before we finally scrapped it. With these two transmitters we used about 120 watts input. We decided the location must be at fault, so we adjourned to ZS4E's shack. We could not take any gear with us as it was needed for 20- and 40-meter rigs, so

transferred to the Far East. XU2UU was heard calling W6BAX by ZL2AC. We have just received a report announcing the first VK-XU contact. This work was between Max Howden, VK3BQ and XU2UU. Who in U. S. A. is going to snag 2UU for the first Asian contact? Or are things coming so fast that it already has been done?

CANADA

Alphy Blais, VE2CA, has done considerable pioneering on 28 megacycles and has sent in many reports to *QST* covering solid week-ends of practically no reception of signals. However, reports from this station in March show a tendency of British stations and W9 and V4 stations to break through. VE4BQ was reported by W1AZW and W2JN. VE4HR, VE4EL and VE4GQ were reported by W2JN.

AUSTRALIA

VK3BQ, VK3PM, VK4RB, VK3HK, VK3WG and VK7DX are all active on 28 megacycles. VK stations report West Coast U. S. A. signals r8 and r9! No QRM or QRN!

VK3BQ has a schedule with G2OD for contact between VK and Europe, but so far NC (no contact).

We understand that there are about 30 VK stations active on 28 mc.

NETHERLANDS

PA0DW reports hearing signals from four U. S. A. districts and Africa. We hope that DW will have a transmitter on for the tests and that will mean more new records.

NEW ZEALAND

ZL2AC and ZL1AN seem to be the active stations from New Zealand.

U. S. A.

Many stations in this country report reception of other U. S. A. stations on the 28-mc. band (harmonics and fundamental). We will not attempt to list these stations completely, but mention the outstanding results coming to our attention as encouragement to all who work on the 28-mc. band.

W2A1S has sent in several reports on 28-mc. work. This station has been hearing W6 stations as well as local transmitters. W2A1S has a transmitter using "250 volts d.c. from light mains and a Burgess B Battery" for plate supply to a Type '10 tube in t.p.t.g. circuit. W9EF worked several British stations as well as OZ7Y on February 9th. W9EF was reported r7-r8 by all but one station. W4AA-W4NG has an m.o.p.a. transmitter on 28.4 mc. W6BAX worked several VK and ZL stations during March and reports hearing others. W6BAX has been heard by XU2UU and has worked stations on the east coast of

U. S. A. Fig. 1 shows the transmitting circuit being used at this station. The antenna used is 90' long and the feeders are $\frac{3}{4}$ wave long.

W1BGK has had a transmitter on 28 megacycles since the middle of November, 1928. Nothing had been worked although other stations were heard until recently when reports came through from Europe. February 9th was a good day for W1BGK when he was QSO England and Denmark. W1BJD has been reported at G5ML with terrific signal strength. W1BGK uses an ultra-audion transmitting circuit and a full-wave 28-mc. antenna with single wire feed.

W2AHT has a transmitter on 28 mc. W6BTO has been reported on the east coast, U. S. A. W2NM and W2ACN have been doing good work on 28 mc. with d.c. crystal-controlled transmitters. W9BYC, Boulder, Colo., has done some excellent work with his Type '10 transmitter

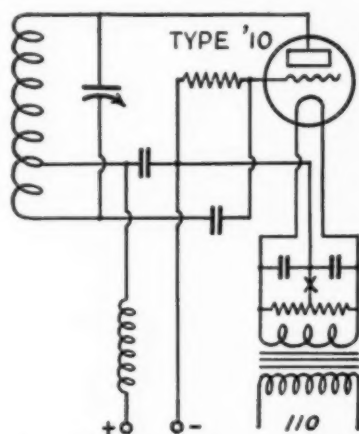


FIG. 2. — OSCILLATOR CIRCUIT AT W9BYC

working everything active as far east as England. Many stations report working or hearing W9BYC. We will endeavor to obtain a photograph of this station for display in this report, but if unsuccessful we will have it next month.

Our old friend on any new band of frequencies, NKF, using a large directive antenna,* is not without its share of reports. Reported heard from California to Europe, NKF is hampered in reception on 28 mc. by commercial harmonics. It might be well to state here to those who have not tried reception on 28 mc. that HJG is a commercial station with a loud harmonic on 27,260 kc. (11.05 meters) — just one long meter north of ten! His harmonic is r7 here in Hartford, and we usually find that when we can hear it, 28mc. amateur signals will also come through. HJG's harmonic is a good marker — and indicator of 28-mc. conditions in this part of the world.

*Read dope on the antenna in April *QST*, pp. 9-18. — EDITOR.

W2JN

W2JN, the station of Mr. C. K. Atwater, 340 N. Fullerton Avenue, Upper Montclair, N. J., has been hammering away at 28 megacycles for two years. We have received reports from Mr. Atwater from time to time and W2JN, with a d.c. crystal signal, is to be commended for the untiring work done in an effort to make a "go" of communication on this band, apparently so elusive to the faint heart and unpersevering.

W2JN's exploits really rate a separate head. In a high percentage of foreign reports W2JN is rated as the most consistent station heard. W2JN holds the laurels for first W-ZS and W-OZ contacts, both of these records being made on January 1, 1930 — quite an ideal way to start off the new year. There are so many items of interest to note regarding this station that it is hard to know what to use and what not to and we have other announcements to make. W2JN has the honor of verifying the first two-way transatlantic contact. This record was made April 29, 1928 with F8CT in France. We have just received full description of W2JN and will publish it next month.

GENERAL

That is certainly an imposing amount of communication. Records will probably be made every week-end from now on. Summer is coming. Our lower frequency bands will be racked with bursts of Old Man Static. Apparently 28 megacycles is free from this. WIDEF, while testing with WICEI during a lightning storm, noted that there was no sign of static. Power leaks appear to be at a minimum on this band. The only trouble from interference noted is from automobile ignition, and directive receiving antennas probably would reduce this to a minimum. Fading seems to be present on 28 mc., but it is not the quick fading noted on 14 mc.; it is gradual and of comparatively small degree. When a signal finally does fade out, however, the receiving operator left holding the sack might just as well close up shack for that day, since the fading station will not reappear until the next day. We have no definite information on time of day for best contact with various foreign localities, but generally note that things start to happen about 1400 G.C.T. and continue for four hours. We hope to be able to present more definite information on this phase of 28-mc. communication next month.

W2JN reports that signals from Europe are steadier and have greater signal strength on 28 mc. than on any other band. G5ML seems to have the same to say about U. S. A. signals, reporting that they have "terrific strength."

At present, activity is keen on week-ends. After more work is done and best times of contact

are realized, this band will be more popular during the week. What is needed is accurate information on all phases of 28-mc. communication.

The transmitting circuits used by successful stations on 28 mc. vary from crystal d.c. down to a.c. Hartley. Our advice on transmitters is to use the circuit you are most familiar with, have apparatus for, can connect up most efficiently; and above all have the note as clean and steady as you never had it before. This 28-mc. band is 2000 kc. wide but we do not want any crowding!

When we visualize the possibilities of this 28-mc. band our fond dreams of an ideal band seem to be realized. This 28-mc. band is just tricky enough to whet the appetite of the most blasé of amateurs. Any amateur successfully making contacts on this band of frequencies can well feel satisfied with a task well done.

Think how our antennas are going to be simplified. A half-wave 28-mc. antenna is about 16.5 feet long. The feeder is another 8, 24 or 48 feet — suit yourself. At this point we want to stress the importance of directive antennas. Possibly many of the stations who are having unusually good communication on 28 mc., unknowingly have directive radiating systems with reflectors in the form of steel buildings, metal walls, gutter pipes or a piece of unused antenna wire properly spaced from the intended antenna to give a low-angle concentration of the radiated energy. It is rather too bad that we haven't a two-letter word to substitute for "directive antenna," for amateurs seem to shy away at the mention of such creatures. We suspect they have in mind the complicated 200-foot high Marconi reflectors or some of the structures at Rocky Point with mile after mile of Beverage antenna; nothing of the sort. Hang up a piece of wire (same length as the antenna) a quarter wave (8.2 to 8.77 feet) away from the horizontal antenna, either "behind" or "in front" of it and you have your directive antenna system. Simple? You will find that you have increased your low angle radiation, which is the only part of your total radiated energy that is effective. This will make the 7.5-watt transmitter have as much signal strength as a transmitter several times as powerful with a non-directive antenna. This is not only theory; it is a practiced fact and works out better in practice than theory.

We must be pardoned for spurting forth with so much enthusiasm. We cannot say any more without letting it out of the bag, and we cannot hold off any longer. Twenty-eight megacycles is ripe and *we are going to have some tests*. We have not time to correspond with foreign sections and be assured of their coöperation but they will have advance notice—and it will probably be done on 28 megacycles. We will spend our week-ends at W2JN relieving Atwater if necessary, but we will get the news across to all impor-

tant outlying sections of the I.A.R.U. These forthcoming tests—wait, we need a little display here,

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will be held in June. They will be on May 31-June 1, June 7-8, June 14-15, June 21-22 and June 28 and 29. All active and interested amateur stations are invited to get in on these tests. What active amateur can resist the lure of this band that is at last holding forth some of its rewards?

Right here we want to compliment those amateur stations, all over the world, who have pioneered for over two years, for their "stick-to-itiveness." The least that the rest of us can do is to hide our shame and move to this higher strata of amateur frequencies—and do it in these tests! We have had a new batch of classy WAC certificates made up and the pen is wet, waiting to see who will be the first to rate a WAC for ten meters. You will have competition, too. G5BY is active on this band, but so far has not put the stunt over. And W2JN has the jump on many of us too, but one little 7.5-watter with a 16-foot antenna and reflector with 8-foot feeder may snag XU2UU just at the right time and leave the rest of us in the dust. Just time enough to get everything shipshape. What say, fellows, let's make QRM on 28,- to 30,000 kc. during June.

Roanoke Division Convention

AT the close of the 1930 annual Roanoke Division Convention held at Charlotte, N. C., March 21 and 22, all delegates unanimously declared this the best and biggest convention the Division had ever witnessed. The liberal and varied assortment of entertainment features assured the full enjoyment of everyone in attendance from the newest brasspounder to the most sophisticated "final authority." Plenty of excellent information was available to all classes of amateurs at the several technical sessions. This was no ordinary convention. Every event started on time as scheduled! While there was ample chance to renew acquaintances with old friends and delegates in the course of trips and lunch hour periods, there was none of the tiresome "standing around" waiting for the program to begin seen at some amateur affairs. Entertainment a plenty was interspersed with technical and traffic discussions, movies, inspection trips and contests, some of which were humorous, interesting and educational at the same time—not to mention the valuable prizes for those who took part.

Friday morning dawned fair and bright and a record first day registration resulted. First on the program was a 15-mile automobile trip and visit

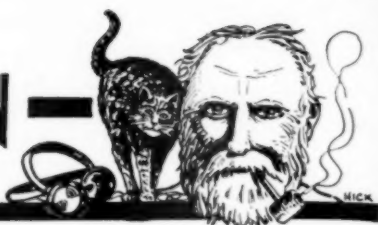
to the 110,000 KVA Riverbend steam power plant of the Duke Power Company where coal is pulverized until it can be burned like oil. Following a theater party at the Carolina Theater, the delegates adjourned to the Chamber of Commerce for a traffic meeting and discussion of "frequency observance" conducted by F. E. Handy, Communications Manager, of A.R.R.L. Headquarters. Division Director W. T. Gravely was in evidence early and at this meeting ascertained the views of those assembled on the extension or further restriction of the 3500- to 3550-kc. radiophone band and on other matters of general concern. Not until after discussions lasting well into Saturday morning, however, did the majority of those assembled "call it a day."

Radio Supervisors L. C. Herndon and George Lewellyn conducted examinations Saturday morning for over 35 candidates. Following the official welcome of Chairman Gluck, Lieut. R. E. Wilson, U. S. N. (C.) R. from the Naval Base at Newport News, Va. and Captain H. G. Fairbanks of the Army Engineers, most ably representing the C. A. S. O., explained in turn the Naval Reserve and the Army Amateur Radio System. We were glad to observe later that a good number of those present accepted the opportunity to file applications and line up with one or both these services. A number of technical contests were held. Dr. E. C. Woodruff, r. f. choke specialist and A.R.R.L. Director, was persuaded to disclose some of his latest apparatus. His explanation on the famous "T.N.T." transmitter held close attention until the lunch hour, after which the technical discussion was resumed and continued with specifications on receivers, monitors, field meters, chokes or what have you from WSCMP's bag of tricks.

A trip to the new A. T. & T. repeater station was the next order of the day. One hundred fellows were on deck for the big banquet which started right on the dot after a brief intermission. Director W. T. Gravely was Master of Ceremonies. Amos 'n' Andy favored the banquet with their presence (via WBT). Then came varied (We wonder if this includes "Oh, You Lucky Little Devil," sung for our C.M.—EDITOR) entertainment from headliners at a local theater and group and individual dance numbers gracefully executed by Charlotte young ladies. Speech making was limited to five minutes, a plan which enabled all to be heard and resulted in universal satisfaction. Liars contests, Q-code spelling bees, a search for the ugliest ham, the one with the biggest feet and many other events were followed by more first class entertainment. Card tricks, water and wine experiments, sleight of hand stunts and many unusual appearances and disappearances were made possible by black magic under the capable direction of a professional; F. L. Bunker, ex4CE, Greensboro, N. C. Chair-

(Continued on page 80)

SAY, SON-



put away the Wouff Hong and the Rettysnitch a minute. I read something in the paper the other day that's worth considering by all hands. Somebody's mother wrote it. You can see Mother sticking out of it on all sides. It surely does make every one who reads it think of that little old lady with the soft look in her eyes when we used to take our troubles to her. No doubt about it, son, there is nothing in all this big world of ours that comes up to Mother. She's the one that is always back of us all, through thick and thin. She's the one that can be counted upon to stay to the end, no matter what that end may be.

It reminds me of a well-known picture, and dog-goned if *QST* would make a mistake printing a copy of it. Mother figures so big in amateur radio, with her jelly glasses and her glass towel rods and whatnots out of the kitchen, that she rates having her picture in *QST*. We ought to adopt it as our Radio Mother. The picture shows a big husky traffic cop, holding high in the air his brawny arm, stopping all the big trucks, busses, cars and horses, while a little old lady crosses the street in safety. Under his big sheltering arm she looks very little. The title of the picture is the biggest thing about it. It is, "Somebody's Mother." Hard-boiled old beachcomber that I am, I have to swallow a couple of times every time I look at it and read the title.

It could easily be the little Radio Mother's picture, she who wrote to the paper. This Radio Mother writes something like this:

"In case any one wants to know what it means to be the mother of an A.R.R.L. member, I shall itemize. R.M. prepares the hot cereal for early morning breakfasts. R.M. provides the milk and cake for the late snack before bedtime. R.M. types reports, removes precious family pictures from their frames so the latter can be used for licenses and certificates. R.M. pays for the new lead-in wires, new antenna and other wires. R.M. answers the 'phone and the door bell. R.M. soothes the neighbors when signals get out of their proper channels and ruin broadcast reception. While not as important as the dry batteries, R.M. is a useful adjunct to the amateur station."

Just you bet your life she is a useful adjunct to every ham who ever lived. She's about the most useful adjunct any man ever has, though he live

to be a million. And say! Pipe the way the mother spirit shines out in that little epic.

She says in another place: "If I had any lingering doubts about the wisdom of sacrificing old pictures for new licenses and permits, they were all swept away one wonderful Sunday morning when I came down to my kitchen to find a very much elated young man who exclaimed, 'I worked WFA!' At 11:30 he had picked up the signals of WFA. Followed hours of patient waiting while the operator in the Antarctic delivered messages and news to various parts of the country." Then a CQ from WFA, and the thrilling contact was made.

Listen here, you young squirts who have not yet been able to appreciate what Mother means, make a note of the way Mother came through with the picture frames. She was glad to do it. She's always glad to do anything for you. When you get spliced, make a note that the little wife will put up a scrap that will make a bob-cat and dog fight look like a disarmament conference, when you suggest that she can be the old family stuff and let you have the frames for your licenses. You will only venture the suggestion once.

But Mother is different. When you filch her jelly glasses to make a rectifier she says, "Were jelly glasses, I ask you, ever put to better use?" Wife will not say that. She will snatch you bald-headed. A wife is a useful adjunct too, all right, but she's for putting the kids first and letting the old man shift for himself if it's a question between the two.

This Mother who wrote the article in the paper is some ham's mother all right, and here's hoping he appreciates her. Let him treat her kindly, for he will not always have her. When she is gone there never will be anybody to take her place. She tops everything in the station, boys. She's always in resonance, her wave is always pure, her note is the one and only perfect D.C., she never wobbulates the slightest fraction, she never fades and she never fails to answer your QSL card. Come on, lads, hats off and all up! Here's to the finest thing in the amateur radio station—MOTHER.

The Old Man.

An International 'Phone Dilemma

By The Alaskan

THE year of 1928 brought the first commercial use of radio telephones for communication between craft on the fishing grounds of Alaska. At that time they were in use on three cannery tenders and one floating cannery, all owned by one company, and operating in the vicinity of Kodiak Island where interference was negligible.

In the spring of 1929 several packing concerns became interested in radio telephony as a means of communicating between their boats and from the boats to the canneries. At the start of that year's fishing season there were about twelve boats and twelve shore stations equipped to operate on almost the same wavelength, and special permission was granted by the Radio Commission to operate these installations (boats only) without licensed operators. It fell to the lot of an engineer or the skipper of each of these boats to operate his ship's radio.

Let us turn back to a day in the latter part of July, 1929 — and see what might have happened.

Here is the Scandinavian skipper of the *Windward* calling another company boat, the *Joan W.*

"Hallo *Vindvard*, hallo *Vindvard*! Das is Veegan on *Yone Wubble-joo* calling you. Hallo *Vindvard*. Alright now, you hare me now coom back and Aye turn on for you."

Then the voice of John Jacobsen, engineer of the *Windward*:

"Halloo, halloo, halloo. Vun two tree foor, vun two tree foor. Halloo. Yah sure, Aye hare you, you bet. And Chris (skipper of the *Windward*) say he lak to know why in — you don't quit loafing around and shake your legs. He say you haf been tree foor day yust laying ofer dare vaiting foor das fog to lift and ve trying to patch up das hare trap and not gattin novares quik. Chris say he spose you vant him to come ofer dare and show you vay ofer hare. Vell, fog is lifting hare now and Aye can see half mile out from das Blake Rocks trap so no use why you can't come ofer hare now. Alright, good-bye, go ahead."

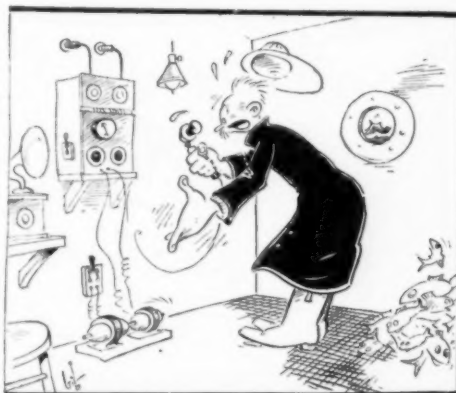
At which Wiggen gets duly excited and comes back like this:

"Yah, yah, for two tree day now all Aye hare is 'Chris say dis' and 'Chris say dat.' All das crazy faller Chris know how to do is call me on dis vireless yigger and say help me do dis and help me do dat. Yah. But he always get you to say it for him. Yah, Aye show him dat Aye can coom ofer dare and fix dose Cape Fox trap myself and Chris can go yoomp ofer board if Aye care. Ve be dare in two hour. Coom ahead."

"O K Veegan. Yah, Aye gat you. But ven da *Yone* coom das far in two hour you bet den Aye skal eat my hat. Aye will lissen foor you in two hour. Good-bye now, good-bye."

Wiggen answers him and OK's, but we can see they are too busy bawling each other out to make sure of the *Windward's* position. Blake Rocks is ten miles farther from the *Joan W.* than Cape Fox and Wiggen would steer a course direct for Cape Fox thinking the fog had risen there. And if it has not — well, let's wait two hours and see what happens. Let's jump the two hours; it's too long to wait.

"Hallo *Vindvard*. Hallo *Vindvard*. Hallo *Yon*. Veegan calling you from da *Yone Wubble-joo*. Ok you get me now? Go in."



All das crazy faller Chris know how to do is call me on dis vireless jigger . . .

"Yah, yah, sure Aye gat you. You yell so hard Aye don't need raddio sets for hare you. Vell, vot Aye tal you? You be hare in two hour you say. Vell Aye don't see you and Aye can see a mile out now. You tink *Yone* is flying machine you get here to quik? Alright, good-bye, go ahead."

"Hallo, hallo. You sure am crazy. Ve can't be mile from Cape Fox right now and fog is tick as your brains. Ve can't see das bow of das hare boat now. You tal dat crasy Svede skipper to blow his whistle so — Ouch! Pfs-s-st!" The *Joan's* carrier wave stops. Something wrong!

John, on the *Windward*, keeps calling but with no luck. Finally the *Joan* starts up again.

"Hallo, hallo *Yon*. Are you dare? You gat me? Coom ahead."

John seems excited now as he comes back.

"Yah, yah, yee hviz vy you don't answer me? You tink Aye stay hare all day to lis-ten for Skoovy skipper vot can't say his own name right? Aye try tal you ve not at Cape Fox. Ve at Blake Rocks. *Blake Rocks*. You gat me? Always you lie how fast you go. Aye thought you know ve at Blake Rocks. Alright, coom ahead."

"Hallo Yohn. Yah, you smart faller and yentleman and das anodder lie. Yah, you can't say Blake Rocks so gude faller can understood it. Ve vas going along fine and you say no fog in a mile of you and Aye tink ve vay out in da clear and Aye leave her go fool speed. Den boomp,



Den boomp, boomp! We hit something.

boomp. Ve hit something. May hand he hit das hare little clock vot say 'miles-Aye-am-per' on dis vireless yigger and Aye catch a kick in my pants vot feels like Aye haf rumatics in my arm. Das hare vireless ting vit Yerman lights and crazy clocks and Irish telephone too much foolishness for me and Aye tooch das hare clock with das Mike's 'phone and it makes flash of fire and clock stops viggling so Aye shut down das fool ting vile Aye look around vot happened.

"And hare ve are half out of vater on da beach at Cape Fox light ven you say dare is no fog! So Aye am going to qvit das hare crazy boat



vit the vireless gear and Aye go back to Sveden vare no Norske liars tal you it is sun shine ven it is tick as pea soup and Aye vill not even lissen for you so coom up hare and pool us off das hare

rock and bring das Chris vit you, by yee!" . . .

The "A" battery is dying out so let's turn our receiver off!

QST Adopts a System of Uniform Tube Designation

THE evolution of a system for uniformly designating tubes of the same type which are manufactured by a number of concerns has always been an editorial puzzler. The attempt to designate tubes by general type alone not only introduces editorial complications but also may sometimes result in ambiguity. However, the simple system we have adopted appears to escape most of the pitfalls, and those we have not seen in advance will be met as they occur.

The method in general is to use the last two figures of the manufacturers' type number preceded by the capitalized word "Type" and an apostrophe. If a letter follows the last two figures of the type number, it will be added with a hyphen intervening. Here are a few illustrations:

Radiotron UX-210 becomes Type '10. DeForest Audion 422 is designated Type '22. Eveready-Raytheon ER-224 is generalized as Type '24. The Zetka Z-250 under this system is Type '50. Cunningham's C-300-A is now Type '00-A; and so on through the whole list of tube types which have the last two numerals of their type numbers in common.

There are a few tube types which have the last two figures of their type numbers identically alike, although the tubes differ widely in characteristics, and this pitfall must be avoided. Type '45 might refer to Areturus' 145, a receiver power output tube — or the UV-845, RCA's 50-watt modulator tube! In such cases, therefore, the general type designation will indicate the more common receiving tube. The power tube will require further identifications.

In addition to this difficulty, there is yet another. All tubes of the same general type do not have identical characteristics. Many Type '10 tubes are designed and specified by their makers for use as audio tubes only, and are not intended for use as high-frequency oscillators. If an oscillator tube is designated in a *QST* article as Type '10, therefore, the designation is for only those Type '10 tubes which are specified as oscillators by their manufacturers.

Again, there may be instances of tubes of a certain make but of a general type — which have characteristics sufficiently different from other tubes of that general type to make them particularly applicable to a special purpose. If the Whatnot Tube Company produces a Type '10 which has an asbestos-wrapped filament and a fire-brick envelope, *QST* reserves the privilege of specifying the Whatnot 910 for oscillators to be operated at 56 mc. in blast furnaces.

— J. J. L.

A.R.R.L. Coöperates With the "Arctic Patrol" in Mid-winter Maneuvers

Work With Army Air Corps Successful

By F. E. Handy, Communications Manager

"Thank you and your organization for the splendid support you gave the First Pursuit Group Maneuvers in connection with short wave radio communication. I am perfectly amazed at the results produced by your enthusiastic and able members."

— F. Trubee Davison, Assistant Secretary of War, In Charge of Army Aviation.

"In behalf of the fliers, I want to say we greatly appreciate the coöperation of the members of the A.R.R.L. Their aid greatly helped the progress of the flight." — Major Ralph Royce, Commanding, First Pursuit Group.

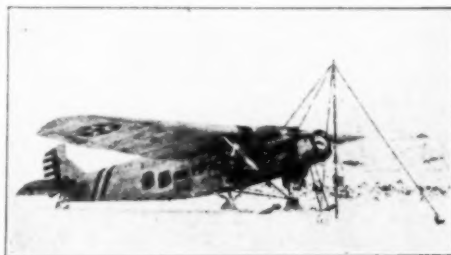
"The Air Corps is very grateful. Some of the amateurs did exceptional work. The Washington Radio Club is a live organization and a distinct credit to the A.R.R.L. The flight was long drawn out and called for an extension of effort beyond that previously contemplated. Let me express my sincere appreciation for your help and thank you, and through you, the headquarters station at Hartford which assisted in such a helpful manner." — Captain H. M. McClelland, Office of the Chief of the Air Corps.

"Thanks for your splendid coöperation. Hope we can try another test under the same conditions. 73." — Staff Sergeant K. D. Wilson, W3GT, operator ABC.

"With the little time to prepare, amateurs did well. W1MK was copied nightly and the news relayed to the officers of the Field who appreciated it, for telegrams were at times much slower. Six operators here always will be ready to coöperate with the A.R.R.L. in anything." — E. Waller Gray, WYE, Selfridge Field, Michigan.

EIGHTEEN pursuit 'planes and two army transports under the command of Major Royce took off from Selfridge Field, Michigan, on January 10th for a flight to Spokane, Washington, and return. All the 'planes were equipped with skis instead of landing wheels, for this flight over the plains and through the mountains was undertaken in the very dead of winter as a test of the personnel and equipment under such special conditions. One of the cargo 'planes was furnished with high frequency radio apparatus to determine the practical utility of such equipment during long distance flights to remote sections. Arrangements for amateur coöperation were completed in late December and active amateur stations along the entire line of flight were chosen from our A.R.R.L. records and informed of preliminary flight communication plans by special bulletin. The flight of the First Pursuit Group is now a matter of history. The record is one of flights made in the face of blizzards and sleet marshalled by King Winter. It is a story of tussles with low temperatures, high winds, low visibility due to mountains and fog, of perseverance and victory in the daily task of starting twenty motors chilled by long exposure in the open. Temperatures reached 32 degrees below zero at Great Falls, Montana. A temperature of 20-below was not uncommon for Minot, North Dakota, and other points en route. There were no heated hangars or garages to help. The pursuit 'planes were faster than the heavily laden transports so that the special heaters carried for the motors, a complement of mechanics and also the radio 'plane and operator, were out-distanced. The Group, therefore, suffered from the lack of some aids to cold weather navigation and in consequence met with some unexpected difficul-

ties. The fact remains that the First Pursuit Group surmounted all obstacles and gained ample experience in flying and handling 'planes under adverse conditions. The Group covered 3500 miles, making its objective, then returning to its base, Selfridge Field, arriving there on the evening of January 29. The personnel of the expedition numbered forty-three and there is little doubt that every one of these men looks back on the Spokane Flight as the experience of a lifetime.



THE FORD TRI-MOTOR TRANSPORT 'PLANE

The temporary antenna support as used in Minneapolis is shown. The antenna runs to lead-in under the floor.

Although several of the pilots were chilled or rendered *hors de combat* by frozen faces and frozen hands and feet, there were no serious accidents. Of course, there were a few broken axles and damaged skis and wings but those must be expected in piloting a score of 'planes over a 3500-mile course with so many natural handicaps. One pilot was forced down fifty miles from the nearest telegraph line or railroad with a broken piston. One 'plane was damaged beyond repair near Beach, N. D., when the pilot crashed in a bliz-

zard. Fortunately, his injuries were not serious. Plumbers firepots, blow torches, live steam, hot oil and Prestone were used to aid in starting the 'planes at different times. But it is not the purpose of this article to repeat the detailed story of flight difficulties. Most amateurs are sufficiently familiar with the daily press stories which included all details.

The communication story will most interest amateurs, however. For three weeks (January 8 to 29), amateur stations all over the U. S. A. stood by to assist in the flight communications. There were three important aspects of the coöperation of the League with the Army fliers: (1) A route to and from the fliers over which reports, messages, orders or press dispatches might be handled by amateur stations must be established and maintained to function as speedily and accurately as possible — and at least once daily. (2) Daily press messages were to be filed by Major Royce, relayed to a message center at Hartford or Detroit and Washington, there to be addressed to newspapers in every city, town and hamlet; sent by stations at the message centers, to be picked up and copied by amateurs all over the country and delivered to local newspapers with the Army Air Corps request for publication. (3) Daylight coöperation of amateur operators was desired in monitoring the frequency of the fliers continuously to intercept possible distress signals, reports of grounded 'planes, needed supplies or other dispatches relating to the safety or welfare of the Group during flying hours (8 a.m. to 4 p.m.).

It was realized, due to the nature of amateur radio work, that but a limited number of amateurs along the line of flight could help by manning stations or listening posts in the daytime. Affiliated club stations manned by several operators were able to arrange continuous watches to help in a number of cases and are to be commended on their efforts. The General Electric Company kept watch the first few minutes of every hour for daylight emergency communications. Selected stations of the Army Signal Corps Net were also on the job (during daylight hours) to supplement the amateur work and insure the safety of the fliers. These stations were relatively remote from the line of flight as compared to some of the amateur stations, however. It is necessary to state at this point that since the 'plane carrying the high frequency equipment was seriously delayed, the plans for this third aspect of the coöperation were of little practical value after the first day, since the transport carrying the radio operator was unable to follow the pursuit planes closely enough to communicate intelligently regarding their movements. Nevertheless, much was learned that should prove of value in planning such communications contact for the future.

The itinerary of the flight is indicated by the map which accompanies this report, the northern

route being followed on the trip west to Spokane and the southern route taken for the return trip. The expedition originally planned to take off January 8th, but was delayed two days by an unexpected sleet storm which coated the planes with tons of ice and made departure inadvisable. Four days were allowed for each half of the trip, but conditions made a change from the original time schedule necessary.

ADVANCE PLANS

Following a request for coöperation, a conference was arranged for two days before Christmas. H. J. Adamson, representing the Air Corps, discussed the proposed flight of the First Pursuit Group with the writer. Details concerning the high frequency equipment to be taken on the flight were unknown at the time. Nevertheless a tentative agreement was reached. After the holiday, more definite plans were formulated and rushed into final form. The time was short. The "Spokane" route was laid out after some research to determine the reliable and active reporting stations from our A.R.R.L. records. A skeleton route consisted of the reliable stations located at points where the Group would pause at noonday or rest at nightfall. Intermediate stations near to the line of flight in addition to those on the main route also received special advance bulletins and were asked to help. But there was little or no time for preliminary tests. A number of messages was sent out with a view to perfecting and testing the line-up at the same time. Each station in the chain was asked to make schedules with the points east and west next removed with which reliable contact could be effected as well as to prepare for work with the message centers.

Next in importance to our route were the plans for transmission and delivery of the press dispatches expected daily from the fliers. Two-way work between amateurs and the radio-transport 'plane was contemplated throughout the flight. Press dispatches relayed to Washington and Hartford must be retransmitted to amateurs all over the U. S. A., copied and delivered locally in every community. Arrangements were next completed for transmission of dispatches to the papers from Washington, Detroit and Hartford stations three times nightly (10:00 p.m., midnight and 1:00 a.m. E.S.T.) during the flight on 7150 and 3575 kc. C. J. Walter, W3AWM, Secretary of the Washington Radio Club coöordinated the work of all the Washington, D. C., stations in the flight coöperation in addition to work from his own station. Section Manager Wise, W8CEP, handled necessary organization arrangements on the Detroit end. W1MK operation was arranged to take care of the official and press broadcasts nightly except Wednesday, these transmissions to be sent simultaneously on the two frequencies mentioned by use of two separate transmitters.

On Wednesday nights W3ASO, W3BWT, W8CEP and W8DMS arranged to fill the gap and transmit on 3575 kc. W3LA, W3GT (W3LX and W3CDQ operating) and W8DMS would send the dispatches on 7150 kc. Later, at the request of Section Manager Quement, the dispatches were sent on the 14-mc. band from W3AI, W5QL and W1SZ for the benefit of west coast amateurs.

At least six weeks' time must be allowed for preparation, publication and distribution of information through QST, so that course of making plans known was out of the question. However, the existing A.R.R.L. field organization with 1500 active and reliable Official Relay Stations well distributed nationally, always ready for an important and worthwhile job regardless of difficulties involved, could be notified of the flight communications arrangements. There was barely time for mail notices to be duplicated to all after the message centers had been lined up. Club and C.D. officials in each locality coordinated the work of local amateurs to prevent unnecessary duplication of effort. Informal meetings and telephone conferences were held to the end that we might offer the Air Corps the most effective performance possible in the second and third aspects of our cooperation. Thus in the short space of two weeks' time arrangements were established for handling dispatches two ways with the First Pursuit Group through its telegraph plane or by way of amateur stations en route, for taking press dispatches for relay eastward, for the retransmission of these dispatches to all stations and papers on definite schedules so they might be delivered in all cities, for watches during flight to intercept emergency traffic. At all times before and between the schedules for transmissions to all amateurs, the stations at the message centers and along the flight route were held in readiness for the relaying of flight traffic. To avoid delays, arrangements were made for the telegraph plane to broadcast its dispatches and for the message centers to broadcast traffic at definite times if and when two way contact could not be established quickly.

W1MK's operating hours are between 7 p.m. and 3 a.m. usually. Additional afternoon operation was arranged to further the purposes of the flight. In addition to regular watches kept by RP, extra shifts were taken care of by EV and FH. Hourly stand-by schedules were arranged with Washington stations to facilitate the ready exchange of information and necessary transfers of messages for the First Pursuit Group without delays. In order to devote full time to the flight work, it was necessary for W1MK to cancel all regular traffic schedules temporarily.

While these arrangements were in the making, Staff Sergeant K. D. Wilson of Bolling Field (W3GT) was sent to Dayton, Ohio, to complete the installation of the radio equipment on the transport plane and make preliminary tests dur-

ing the flight to Selfridge Field to join the First Pursuit Group. The telegraph plane was assigned the call signal AB6. An oscillator-amplifier transmitter using Type 10 tubes and capable of working on either 9370 kc. (32 meters) or 5552 kc. (54 meters) was installed. Wilson was able to receive amateurs through a high noise level only



STAFF SERGEANT K. D. WILSON,
AB6, (W3GT)

in the 7000-kc. band. A 400-volt plate supply was available. Storage cells charged while the plane was in flight were the prime source of power. These were good for about three hours when fully charged. Different antennas were tried out and 5552 kc. chosen as the best all around working frequency. But as we shall see, the best of preliminary arrangements must be modified by circumstances. The excellent and thoroughly tested initial installation, with such an experienced amateur as Wilson at the key, insured the success of the radio operation. But the fact that the Ford transport on which the installation was made could not keep up with the faster pursuit planes and that it became further delayed when a forced landing was made in deep snow under unfavorable circumstances necessarily isolated AB6 and made the telegraph plane useless during the latter part of the flight insofar as communication with the main body of the First Pursuit Group was concerned. Nevertheless, excellent communication was established and maintained with amateur operators by Wilson operating AB6. But this part of the story is appropriately told by the man behind the station.

AB6

By Staff Sergeant K. D. Wilson, Operator

IT takes a sense of humor to write the flight of the First Pursuit Group along the Canadian border during January in sub-zero weather while down in the southwest corner of Mexico (Tapachula) with the temperature close to 100 waiting for repair parts for our plane. (Wilson flew with AB6 from Miami, Florida to Colon,

Panama, February 20 non-stop in 11 hours 20 minutes.)

Arriving at Dayton December 28, a m.o.p.a. transmitter and a receiver were installed on a tri-motored Ford transport. A maximum of 1.2 amperes in the antenna on both 32 and 54 meters was obtained while in flight but only .5 or .6 ampere while on the ground. The antenna used on the ground was the same as the one used in flight except that it was held up by an 18-foot jointed pole. This could be adjusted to work on the first or third harmonic, the adjustment for resonance being obtained by winding or unwinding the antenna reel. W8DBK, WSDSN and WSQU were active Dayton hams. On January 4 on the trip to Selfridge Field, contact was established with WAR (Washington), WVS (Ft. Benj. Harrison, Ind.) and WVT (Chicago) on 54 meters and maintained until the arrival at Detroit.

The first ground test for the benefit of amateurs was made at 7 p.m. January 6. Exactly at 7:15 p.m., our old friend W3LA (Washington) answered my CQ. Contact both ways was perfect. At the same time January 8, W3LA and AB6 exchanged three messages and quickly after hooked W9DRR, W9CVG, WVZ (Columbus), W4HK and W9COS in turn, receiving one message from the last named station. All signals had a wallop that night.

On January 9 messages were again exchanged during the contact with W3LA, reception and transmission conditions being perfect in spite of very heavy snow. W9COS, WVZ, W2BAE, W1WV and W1MK were contacted in the hour that followed. All signals were very steady. Later this same night the shielding on the ignition wires of the center motor caught fire and was destroyed making reception during flight impossible except for extremely loud signals. That night also the transport started to sink through the ice and several hours' work was required to get it to land.

On the morning of January 10 the First Pursuit Group took off and although delayed, we started for St. Ignace, 200 miles to the north, at 2:10 p.m., hoping to catch up with the Group which was ahead of us. We flew at a height of about 1000 feet, averaging 110 miles per hour. The position was broadcast at Vassar, Bay City, Campbell, and Mackinaw City, Michigan. We landed at St. Ignace at 4:55 p.m. W3LA was unable to copy AB6 due to a high noise level. W9DXP was contacted. A message was sent via WVZ. W9COS was worked. A message was sent W9FZM. Two were received from W1MK with difficulty. All signals were fading very badly.

The Group had made Duluth the previous night. We left early next morning with that as our destination and right away our troubles started in earnest. At 9:30 a.m., we passed Patterson, Michigan, reporting our position. At 9:45 we

ran into a heavy snowstorm at Manistique and were forced to land. I set up an antenna, tested, and at 11:55 a.m. established communication with W9EHI at Duluth. From him I received the weather report and three messages from Washington. A number of messages were sent, and let me say that his wonderful cooperation was appreciated. At 1:35 p.m. he gave us a favorable weather report and we took off immediately. We ran into fog and snow over Amasa, Michigan, and were forced down a second time at 4:20 p.m., landing in a small field. At 4:23 p.m. I hooked Laurium, Michigan. W9EGF sent a message which was relayed to Washington via WSCNR and received one originating at Spokane (W7ACH, via W7AIZ). At 4:33 p.m. I worked W9AXE (Marquette) who had schedules with Duluth amateurs, giving him our location and handling traffic. That night I found we were in one of those famous dead spots in the iron ore country or perhaps partly due to the heavy snow. All signals were weak and swinging and I was hardly able to work W1MK. WVZ was only strength one.

January 12 to 15 a blizzard raged, roads being impassable. I walked three miles on the night of the 12th to the 'plane, communicating with W9EHI at Duluth, but signals died down rapidly due to the fact that the battery had frozen. Anyone who has never started an air-cooled motor at twenty below zero will be unable to realize what we went through on January fifteenth and sixteenth. Finally we got away from Amasa at 2:30 p.m. on the 16th, arriving at Wausau, Wisconsin at 3:35 p.m. That evening at 7:30 p.m., WSQU (Dayton, Ohio) came through very weakly. This was followed by a contact with W2AOF. It was 31 below, endangering the operators' ears and hands so after copying some traffic "QST" from Hartford, W1MK, AB6 signed off. Next morning (January 17) W9DRR at Marquette and later W9GKR of the same city, contacted AB6 and learned of our plans to take off for Minneapolis. W1MK was contacted at 8:22 p.m. However, we lost one of the motors due to the oil lines freezing and so were forced to remain in Wausau for some time. Little radio work was done until January 25, due to the uselessness of the batteries that had been frozen. The storage cells were fully charged but lasted only about an hour on test.

On January 25 the batteries were installed again at AB6, and at the usual time (8:30 p.m.) I raised W1MK sending three messages. Later WSWO at Detroit was contacted. At last, on January 26, we got under way for Minneapolis, getting hold of W9EFK and W9BVH that evening. Two or three flying hours had enabled me to charge the battery partially and the charging was continued while the center motor was being overhauled. Our plan was to proceed west along the "return route" to rejoin Major Royce and the Group as early as possible but instructions

were received to await the arrival of the Group at Minneapolis. On the 27th W2XAC exchanged messages with AB6 and later the same night W9DRR, WVZ and W9BVH were worked. The spirit and hospitality of the Twin City hams was wonderful and I visited quite a number of the local stations. At the key of W9BVH's home I worked W9COS, W9AIR and a number of other old friends. Later, back at AB6, W9AIR was worked again, QST's sent and messages cleared.

As soon as we joined the entire Group at noon on January 28, we left for Wausau. On arrival I worked W9GKR (Marquette), giving him the time of arrival of the twenty planes. We went to the banquet that night, so AB6 was quiet. The following day we left for Detroit via Bay City, sending position reports at intervals. After the battery failed, no more work was done. The transport arrived back at Selfridge Field January 30, thus completing a thrilling flight. I am sorry that we were not able to stay with the Group all the way to Spokane. I will say that we were more than pleased with the response and the cooperation of the amateurs in spite of our limited operating conditions due to power supply, isolation from the Group and intense cold. Stations in every district in the U. S. A. and Canada were copied but no log kept of this. Here is the list of stations worked from AB6 during the flight in the order of the amount of traffic handled by each:

W9EHI W9BVH W9FZM W8WO W4HK
W1MK W9COS W9AXE W9EFK W9DYS
W3LA W9EGF W8QU W9AIR W2BAE W9DXP
W2XAC W9DRR W2AOF W9GKR W1WV

Of course there are many additional reports of different ways in which amateurs helped in the relaying of messages from AB6 or other cooperation with the fliers which cannot be indicated in the log of the telegraph 'plane. The excellent advance cooperation in transmitting advance weather reports from W9FZM (St. Ignace) to WYE (Selfridge Field) was extremely helpful, for example. W9BN, W9BCM, W9DFG and many others broadcast position reports and information at different times. Reports broadcast and messages sent to Hartford and Washington from W8SB (Bay City), W9FHU (Wausau), and W9DYS (Ishpeming) enabled all cooperating amateurs* to tell promptly when the 'plane passed over Bay City, when it arrived at Wausau and the like. W9EQV, Dollar Bay, as well as others, broadcast Duluth flying weather and

*In an undertaking of this size it is impossible to credit all the cooperation given in the several phases of service rendered. Bulky logs, yards of newspaper clippings, reports on AB6 including comment on the arranging of continuous watches, special messages relayed here and there in connection with the flight and the like, have been received from many sources. Many reports are missing either due to negligence or because some amateurs are modest to a fault or thought that what they enjoyed doing was of little moment. We have tried to classify all. If there are mistakes or omissions we can only ask your patience and consideration of these things.

other reports at the start. W9CSI, while under doctors' orders, delivered a great deal of traffic relayed from W1MK while the telegraph 'plane, was in trouble at Amasa, keeping schedules and relaying by telephone while AB6 was off the air, until forced to discontinue his work by influenza. W9BHH, W9AIR, W9CE, W9DYS, W9EHI, W1CGR, W1MK, W9BCM, W9EHX, W9FBJ, W9EBO, W9EJQ, W9CTW, W9DXZ, W8EY, WSCRT, W9EGU, W9COS, W4FT, W9DRR, W9EBO, W9GGA, W9DGS and others unrecorded helped in relaying and delivering AB6 traffic. Hundreds of amateurs were logged calling AB6 whenever the 'plane went on the air. Of course it was impossible to contact all. Amateurs both near and far from the line of flight listened direct to the progress reports. All reported AB6 very steady. The frequency remained fixed from day to day; 54 meters was used for all work. The note was reported as "near d.c." by W1AD (Bellows Falls, Vt.) and others who sent reports to Headquarters after the flight.

During the final stage of the flight when the telegraph 'plane was over Lake Michigan, W9AIR,



A CLOSE-UP VIEW OF TRANSPORT 'PLANE AND OPERATOR

An idea of 'plane size may be had by comparison with the individual (Opr. Wilson). This photo was taken in Minneapolis.

Sleepy Eye, Minn., intercepted the position reports sent when passing Beaver Island and other points hourly during the trip, retransmitting the information to all amateurs and the message centers.

AMATEUR CONTACT WITH THE MAIN GROUP

As we have seen, the telegraph 'plane was quickly left behind and was not available for handling Major Royce's communications from day to day. It was necessary for him to adopt the next alternative, to avail himself of the services volunteered by amateurs all along the prearranged route for filing press dispatches, messages and reports.

On the first day of the flight the main Group reached Duluth. Lounsbury of W9EHI, W9DOQ, W9GKO and others were very much on the job.

But an unexpected difficulty turned up here. In the short time for making arrangements in advance of the flight, one detail had been neglected. Without credentials, it was practically impossible to get in touch with any of the fliers, least of all the Commanding Officer of the Group, due to the great public interest. W1MK had previously contacted W9EHI and was eagerly calling for messages and dispatches. Hours sped by. W9EHI was unheard. The operator was still trying to "crash the banquet" to get the essential information to keep the wheels turning. Finally at a late hour, W9EFK (Minneapolis) was worked. He 'phoned Major Royce at the banquet, and was successful in getting the first dispatch which was promptly transmitted to Washington and Hartford. W9EHI scheduled W9BPM and received useful advance weather reports for the Group.

The flight moved westward rapidly. Due to the length of the dispatches, it was necessary to have reliable contacts and also to move the messages over as great distances as possible to save time spent in unnecessary relaying. It became necessary almost at once to look for reliable "half-way" stations to work directly with the eastern message centers. The greatest credit is due to stations W9DFG (Wellesley Beeman, Jamestown, N. D.) and W9BPM (University of North Dakota, Grand Forks, N. D.) operated chiefly by E. A. Garard. Night after night these two stations stood by in readiness to relay the press and traffic. Without this aid, the advance plans for dissemination of the press dispatches would have failed on a number of occasions and all amateurs standing-by for the broadcasts would have been "let down." When the Group arrived at Grand Forks, Bob Moore, W9FHP, went to the airport, got traffic and passed it to Barker, W9EGU, before the 'planes left at noon. Later in the afternoon, a second message was filed and passed promptly to W9AQH at Minneapolis. On the second night of the flight, when Major Royce reached Minot, N. D., it was W9DFG who got in touch with the Commanding Officer and transmitted the press eastward. This station helped by keeping the East informed of news received through the local press, also handling eighteen separate press dispatches at different times during the flight. The third night (January 12) the Group was somewhat delayed. The long official dispatch from Major Royce came in from W9AFM (Minot, N. D.) through Garard, W9BPM, on this night, a fine bit of operating. W9FZP and W9FHP assisted in the general work at W9BPM. The record shows a message from the Group via W8YA, and W1MK to WYE at Selfridge. On the fourth night, W9BPM had the official dispatch again. Incidental cooperation was received from W9GIH. January 14, W9GKR, W9BPM and W9EHI were all helping but no official dispatch was received. The next day was Wednesday. W8DMS and W8BGY were on the

job and the broadcasts went out from Washington and Detroit on schedule. The Group had a hectic day with 32-below-zero weather at Great Falls. The press came through very late on January 16 via W7AAT and W9BVF. W7FO, M. R. Cooper and L. G. Davies, (W7JX) of the Butte Radio Club, kept a continuous 24-hour watch from the beginning of the flight until January 24 and was instrumental in the handling of our next dispatch. The weather bulletins supplied from W7FO were much appreciated. First official news of the arrival at Spokane was received from W7AFO of that city with the incidental cooperation of W7AAT, W7DD, W7FO and via W9DFG-W9BPM. The following dispatch from Spokane was copied in part from W7AHO by W4JR and also by W9BPM. W1MK got the fragmentary report from both and was able to weld it into one complete report in time for the scheduled transmissions. The dispatch of January 20 came in from W7AHT, Spokane, via W9CND and W2AWU but this was delayed by the stations handling and was received too late to be useful. Unofficial press reported by stations along the "Spokane Route" was used in compiling information to fill the gap. Dozens of stations stood by to help in calling Spokane and the real reasons for omissions or delays on a few reports from the far end of the route are not yet known.

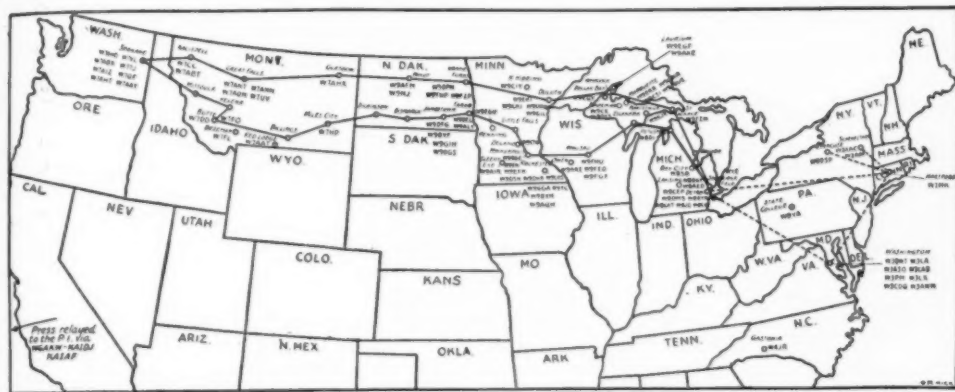
The first long and official report to come through on the return flight was sent "QST" from Miles City, W7HP, on January 23 and copied direct at W1MK without prearrangement. The two following days W9DFG got it in. Major Royce heard that the Ford transport and telegraph 'plane was en route to meet him and word was passed along via W9DFG and W1MK to inform the officer in charge of this 'plane to remain at Minneapolis. Just as soon as the Group arrived at Fargo, N. D., the information was broadcast from W9DEL and this also was copied at W1MK. Later W9DEL was contacted and the official dispatch received. W9DGE transmitted the report from Minneapolis. Information of the arrival at Wausau was received via W9BVH, W9GKR, W9CTW and W9DGE. The honor of handling the last and final press fell to W8AZD at Detroit on the arrival there January 29.

WORK AT THE MESSAGE CENTERS

In general the stations lined up for special work at Washington, Detroit, and Hartford functioned just as planned in advance. Captain McClelland and Lieut. Ennis of the Army Air Corps "sat in" at different amateur stations in Washington and followed the story of communication with and progress of the flight at first hand. An hourly schedule with different Washington stations was arranged by W1MK for the exchange of information with the Headquarters of the Air Corps, to facilitate prompt transmission of mes-

sages, etc. W3PM, W3LA, W3ASO (operated also by W3CDQ and W3LX), W3CAB and W3BWT took turns in holding down the Washington end between 4 p.m. and 2 a.m. daily. All deserve the greatest credit for being on the job

storms. The flight work was put over by personal sacrifice, a substitute being obtained to teach in Stephenson's place nights during the flight. Before Wilson took off, a group of the Detroit men visited him at Selfridge.



THIS MAP SHOWS THE ROUTE TAKEN BY THE ARMY PATROL AND STATIONS WHICH COÖPERATED

The northern route was followed going westward and the southern route shows the return flight

and sticking to the schedules through thick and thin. W3LA was most successful of all the Washington stations in contacting AB6, moving traffic easily — more credit to his two paralleled 210's and crystal d.c.

The chief difficulty in keeping Washington schedules resulted from the fact that W1MK was heavily overloaded at certain hours so that certain schedules could not function. The A.R.R.L. station had to bend every effort toward reception of press dispatches for the nightly transmissions.

The official and special broadcasts required precedence over everything else since all participating League members were concerned. Daily afternoon schedules were kept with Schenectady. W2AOF, W2XAC and W8DSP also were worked for exchange of information with Schenectady. In general, contact with Washington, Detroit and Schenectady was satisfactory. The 3575-ke. transmitter proved most useful for late evening work after the fade-out on the higher frequency. Another transmitter and operator functioning simultaneously with the regular equipment at W1MK would have considerably facilitated the exchange of information during the hours of peak traffic load at this station.

In Detroit, W8DMS, W8CEP, W8DYH and W8AZD kept things moving, likewise. S.C.M. Wise organized the local stations and in addition undertook to send the scheduled press messages on 3604 kc. Wednesdays. Stephenson, W8DMS, devoted much time to daily broadcasting of flight reports and in Hartford, we copied Wednesday night press from this station which was also widely reported from other sections. Some trouble was experienced with antenna failures in heavy sleet

RECEPTION OF DISPATCHES

Now just a word about the success of the scheduled transmissions from the message centers. These were widely copied. Many amateurs off the line of flight depended on getting the latest information from W1MK or the other stations engaged in sending the addressed news. All the messages carried a preamble requesting that they be retransmitted by stations copying them. W9DQN, W9CTW, W8CEO, W9APY, W4WE and many other amateurs unrecorded assisted in the general program in this manner.

QRM made copy "spotty" on 7150 kc. and off-frequency amateur 'phones sometimes broke it up on 3575 kc. When possible at W1MK, dispatches were repeated between scheduled transmissions to enable amateurs to make "fills" where necessary in their copy. On the longer broadcasts, it was necessary for listeners to wait for a later transmission schedule if something was missed. Time did not permit all to be repeated. In some cases rebroadcasting by member-stations was still in progress at 4 and 5 a.m. and it is unfortunate that reports are not complete so that we may inform loyal operators of the good work they accomplish in this way. According to reports, most dependence was placed in reception direct from W1MK, even on the west coast. The utility of the 14-mc. broadcasts arranged at the request of west coast amateurs is unknown.

A number of amateurs was discouraged by the lack of interest of hard boiled newspaper men in the addressed dispatches and in the flight. Of course, wire services covered the activities of the Group from all large cities en route. The telegraph plane was down at Amasa so we had no

"exclusive news" from remote points. In one eastern city, papers used little of the material their own wire services had to offer. A major emergency might have altered this attitude quickly but we are thankful that it did not happen. In considera-

the first "copy" printed. Some successful operators forgot to report or sending in clippings too because they thought the degree of success too small to mention. Modesty or a desire to keep the clippings can be blamed. Many sections where

PRESS REPORTS (BY DISTRICTS)

Station	Paper	Column Inches	Remarks
W1AQL	Bangor Daily News	12	See Note B.
W1CTI	Norwalk Hour	6½	
W1MK	Hartford Courant	78½	Morning paper.
	Hartford Times	29	Evening paper.
W1WV	Boston Post	9	See Note A. It is also of note that little press ass'n material on the flight was used in Boston papers.
W2AA	Merrick (N. Y.) Courier	2	Garbled by paper. Also see Note A.
W2ATT, W2AYM	Brooklyn (N. Y.) Daily Eagle		Three delivered. None used.
W2BGO	Bronx Home News	12	QST copied from 8 to 4:10 a.m.
W3CAB, W3BWT	Washington Herald	7½	
W3ASO, W3LX, W3CDQ	Washington Morning Post	22	With station photograph.
W4HK, W4FX, W4SP	Knoxville New Sentinel	80	Fine, well organized work here. FB.
W6AAZ	San Jose California	60	All copied from W1MK 7150 kc. See Note B.
W6AKW	Lancaster Ledger-Gazette	28	Weekly paper. WSDMS worked Jan. 8th; WSCU Jan. 9th—16 dispatches copied direct from W1MK, one from W9DEL, two from WSDMS. Four relayed to KAIAF. Eight to KA1DJ!!!!!! Splendid work.
W6BZU	Concord Beacon	21	All press direct from W1MK through QRM.
	Martinez Daily Standard	7	
W6EDK	Oakland Post-Enquirer	20	
W7FO	Butte Montana	20½	
W7HP	Miles City Montana	1½	No final report from W7HP.
W8AMA (Wagner)	Erie Dispatch Herald	20	Erie Amateur Radio Club Secretary.
W8AWO	Scranton Republican	8	No daily reports copied.
	The Scrantonian		See Note A.
W8CEO (McAuly)	Pittsburgh Sun Telegraph	29	Full daily reports supplied.
	Pittsburgh Press	19	See Note B.
W8DBK	Dayton Daily News	12	
W8DME	The Auburn Citizen	36	See Note A. Papers busy with local sensations.
W8DMS	Detroit Free Press	..	Delivered each evening and used in early edition.
W8OA	Ningara Falls Gazette	68	Good cooperation.
W8SB	The Daily Mining Journal	10	
W9ACU	Illinois State Register (Springfield)	60	Also relayed to W9Q1.
W9AXE	The Laurium "News"	4	Editor refused to use press.
W9BN, W9DSH, W9EFK, W9BVH, W9DGE	Minneapolis Journal	25	See Note A. Every paper was 'phoned daily and given press by at least one Twin City station.
W9BPM	Grand Forks, N. D.	75	
W9CE	The Daily Mining Journal (Marquette)	20	
W9DEL, W9FWO, W9DIC	Fargo, N. D.	9	Drew, Payne, Newton and Hetland of WDAY also cooperating in flight.
W9FHP, W9FZP	Grand Forks, N. D.	25	
W9FLG, W9DEB	The Topeka Daily	30	Reported by Sec'y Tiffany, Kaw Valley Radio Club.
Hathaway	Chicago Daily News	15	Reported by W9PA.
W9Q1	Daily Illinois Star (Beardstown)	60	
KAIAF	The Manila Daily Bulletin	30	Relayed from W6AKW.
KA1DJ	The Manila Daily Bulletin	40	Relayed from W6AKW.

tion of unanticipated handicaps, wonderful results were obtained in a large number of cities. The clippings turned in from all sources make a stack several inches high after press association and War Department releases are discarded and if laid end to end — but we haven't time to try that. Anyway, the Spokane flight reports make a mighty impressive exhibit!

No doubt there are operators who were discouraged by meeting with difficulty in getting

we feel sure good work was done were not heard from. We wish it were possible to make a correct estimate of the amount of work it was impossible to credit in our tabulation. Thanks are due every amateur who followed instructions in copying and delivering dispatches and in thus helping the

NOTE A. — Delivered to three other papers that gave no cooperation.

NOTE B. — Delivered every night but the paper gave preference to wire services and did not use it every time.

Air Corps and the cause of amateur radio. Those who met with difficulties deserve all the more credit for their efforts to surmount difficulties. As you may judge from the comments of the officers of the Air Corps which have been placed at the beginning of this article, the results were considered well worth while by those for whom our effort was made. The public recognition accorded our work has an importance that cannot be discounted, too.

As proof of the fact that many stations were delinquent in reporting, let us point to the fact that few of the cooperating stations on the western end of the route came through with even a postal reporting the part played by their stations. The facts regarding such participation are missing from this report except in cases where we have been able to dig them out of the logs of some of the fellows in the central part of the country. Routine communications department reports show some additional information. W9EVE, W1RV and W1NI handled a 365-word flight message from Spokane, W7AHT. W8HK handled press from the Army fliers. W9EAT was offered evening press when he worked W7ANT, Great Falls, on 3500-ke. 'phone, but since he couldn't relay it, W7ANT passed it to W9DXO, Bancroft, Iowa. W9EVE and W9ERM handled Army traffic from W9AIR. Viers, W7AAT, worked W6BET, lining up a route from Red Lodge, Montana, to Spokane. W7NY was in touch with W7ABO and W7HP trying to get press for W9DFG.

W9AH, Duluth, gave lots of the press dispatches to the local papers. W8LI, Akron, copied the news from Headquarters and got his name in the paper every night. W7AAW, Bonner, Montana, handled Army flight traffic. W1BD copied press and delivered it to the papers. W9FFD and W5QL were on the job copying and rebroadcasting the dispatches. W5RH-W5BBF copied all the W1MK broadcasts on the flight for the papers. W7ACS, Tacoma, Washington, did his part, copying W1MK through fierce QRM. These among other similar reports make us sure that the cooperation was much more widespread and effective than indicated exclusively by specific reports.

Organized activity was particularly evident over the eastern half of the "Spokane route." Many schedules were arranged by radio to meet the requirements of the First Pursuit Group as it progressed from day to day. At many points amateurs (W9FZM, W9DFG, W7HP, etc.) obtained the necessary permission from the Radio Division to move stations to local airports to better cooperate in receiving weather reports and establishing communication with the outside on arrival of the First Pursuit Group.

Minneapolis amateurs were very active, as well as those we have mentioned in Wisconsin and Michigan. W9EFK and W9EFJ were on

watch all but three days of the flight. Brooke of W9DSH had things well lined up for continuous watches from W9BN and W9DGE as well as his own station when the telegraph plane was in flight. Good contact maintained with WYE, Selfridge, and W9EHI, Duluth. Gerlich of W9BN has a log of which any station might be proud, seven operators cooperating in the communica-



Photo Courtesy "Detroit Times" via W8DMS

SGT. K. D. WILSON AT CONTROLS OF AB6

This photo shows the operating room aboard the transport plane.

The oscillator-amplifier transmitter is shown above the receiver.

tion work, and results of value were obtained. Adams, Soules, Gerlich, Leach, Cottam, Mears and Smith operate W9BN. W9BVH did most excellent flight work and was in touch with W9EGU. W9XI, W9EYL, W9BHB, W9CCX, W9CIY and W9GGA all took an active part. Wilson visited W9BVH, W9EFK and W9BN while at Minneapolis.

North Dakota stations kept schedules with the East consistently and bore the burden of attempting to get the press from those "wide open spaces" in Montana. Much of the great success of the flight work must be credited to the efforts of W9DFG, W9BPM, W9AFM and W9DEL. The operators at Grand Forks coordinated their efforts so that as complete a watch as possible was maintained. E. A. Garard worked W9BPM keeping schedules with W9EHI for all the latest reports from Duluth. Bob Moore operated W9FHP keeping daily schedules with W9DGS at Jamestown for the whole period of the flight. Bob Dettman did his part at W9FZP. Davy of W9AFM handled nine messages from the Group not including the press. These were all passed east through the schedules with W9BPM. W9AFM deserves a lot of credit for the work of this station was carried on while the operator was confined to his bed with mumps. Newspapers and local offi-

cials at Minot received first information on departure of the Group from Grand Forks through W9AFM and W9BPM.

The James River Radio Club arranged Jamestown cooperation so that there was at least one station on the air at all times. W9BVF contacted Spokane direct and got the press on the night when the first three fliers arrived there. W9DFG gave an excellent account of himself as already shown. He got details of the accident at Beach and reasons for the flight being forced down there on the return trip. W9DGS spent hours watching progress and sending broadcasts whenever late information came in. At Fargo a meeting of the Radio Club was held at the State College and arranged a schedule of shifts for a sixteen-hour watch. Payne (W9DEL), Smithson and Drew (W9DIC), Olson (W9FWO), Hetland and Newton (W9DAY-W9ALY) and Hall, Schulz and Sweet of the club were on duty, copying AB6, keeping the papers informed, handling press and traffic. Smithson, W9DIC, took his vacation at this time so he could be on duty all day. The well organized work proved very effective and Headquarters is grateful for the part played by each operator as well as for the very full reports.

In Montana W7FO was the outstandingly active station, operating continuously for 21 days, relaying much traffic and obtaining the cooperation of the Montana Power Company and the Electric and Radio Company for the flight work. For some reason, the Montana stations did not seem to connect on schedule with points east and west. While individual work was attempted by some of the stations shown on our route map, the only detailed report was received from W7FO.

At Spokane W7ABX, W7TJ, W7QF, W7AIZ and W7VL were informed and ready to cooperate. W7AAY reported in to the message centers promptly when he thought the fliers had arrived. Official dispatches at Spokane were started from W7AHO and W7AHT.

But little remains to be told. The experiences of those who took part were most valuable. Much was learned of value to the Air Corps and to the A.R.R.L. in this cooperation. In general, amateur contact work was an enthusiastic success. It may be regarded as unfortunate that the telegraph plane was not able to stay with the Group throughout the flight, but in spite of that, our efforts were modified to meet the situation and with the success that we have indicated. There was an element of personal sacrifice. Amateurs suffered many individual inconveniences that communications might be put through successfully. There was also the reward that comes to operators who have given unselfishly of their best efforts in the knowledge of work well done.

The progress of the flight was followed with intense interest by all hams on the air at the time, whether able to take part in "Spokane route"

work. The slogan at W1MK and the half-way stations was "get that press" and half the country stood by or called on Spokane or Montana to help us over the hard spots. Many operators who had planned to enter the Sweepstakes contest gave this up in order to continue active participation in the Air Corps communication. There were hundreds of opportunities to put over brilliant relays, to work AB6 and win fame and to do worthwhile things. It is estimated that over a thousand stations assisted in some phase of the work at different times. Some remarkable and interesting logs were sent in with reports, notably from W9AIR, W9BN, W8CEO, W6EDK and W9BPM. For example, W9AIR's log covers 22 closely typed pages, without margins. It is a recital that will make an interesting memento of this work for years to come. A unique receiving arrangement with two detectors and tuning units interchangeable at will by the throwing of a four-pole double-throw switch made it possible for W9AIR to follow both sides of contacts with AB6 (or communication between any two other stations for that matter) at will.

A few quotations from typical letters and reports will suffice to indicate the deep enjoyment and general interest in this communication problem.

"Although not the original T.O.M., I am 65 years old, and interested in land line operating from the age of 15. The transmitter is kept in order for emergency use so I jumped into the game and got a great kick out of it. Worked AB6 and handled several messages to and from W1MK. Got the best kick when W9DFG had press and could not get W1MK. Gave W1MK a 'QRZ W9DFG' and they clicked five seconds after." — *Robert S. Rose, W9DRR, Marquette, Mich.*

"Had wonderful cooperation from W7AAT at Red Lodge, Mont., who gave me information and press on schedule. Reports were given to the Signal Officer via W7Y (San Francisco). This was a very wonderful experience and the work was mighty interesting. Long hours have been kept with the occasional help of W6ATC. With my Army net and my A.R.R.L. ORS skeds I was in fine shape for this event." — *Eduard Kohls, W6EDK, Berkeley, Calif.*

"Thanks for a good time. I would certainly enjoy another such expedition. Give RP of W1MK my congrats and 73. He deserves special mention on his fine operating." — *Herman Rodloff, W9AIR, Sleepy Eye, Minn.*

"As for the flight cooperation in general, it sure was lots of fun and I got a great kick out of it. This work was instrumental in leading me to send in that application for ORS appointment. I've resolved to be a real traffic man! Here's to our activities and cooperation and to a bigger and better A.R.R.L." — *Bob Moore, W9FHP, Grand Forks, N. D.*

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An All-Service Portable Receiver*

By Howard Allan Chinn**

THE receiver herein described was constructed for use as a portable short-wave receiver serviceable in the laboratory, in the field, in an automobile or in aircraft. It is light in weight, compact, completely shielded, covers a wide band of frequencies, is very easily portable and is entirely self-contained, ready for operation wherever it is placed.

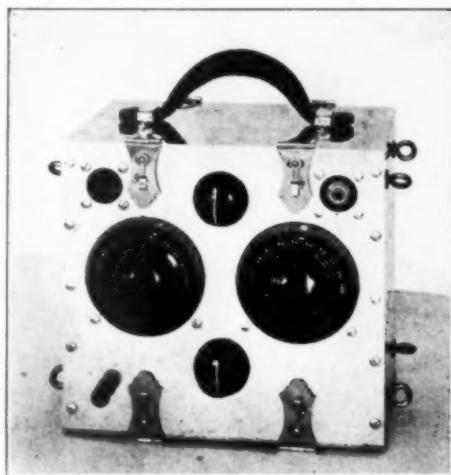
The complete receiver, including the necessary batteries, weighs twelve pounds and the aluminum case measures 5 x 8 x 9 inches. Aluminum was chosen for the cabinet because of its light weight combined with strength and because of the shielding properties of a metal case. Sheet aluminum 1/16-inch thick was used and the resulting cabinet is as sturdy, if not more so, than one made of 1/2-inch wood. Inasmuch as the volume of the wood necessary would have been eight times that of the aluminum (assuming 1/2-inch wood and 1/16-inch aluminum), the metal case is lighter than one made of white pine, oak, mahogany or any of the other common woods. The weight per cubic foot of aluminum is 167 pounds, of white pine 30 pounds, oak and mahogany about 50 pounds. A 1/4-inch cabinet of wood would, therefore, have approximately the same weight, but would by no means be able to withstand abuse as well as the aluminum case. Furthermore, a cabinet of 1/2-inch wood adds almost an inch to all dimensions if the same volume inside the cabinet is to be obtained.

The top and the bottom of the case are hinged in place with a hooked hinge which permits their complete removal, if desired, when changing the plug-in coils or the batteries. The sides and back are of one piece of aluminum bent to shape and with a flange bent on the front edges to provide a means of bolting the front panel in place. This one piece back and sides makes it unnecessary to use angle aluminum to hold the cabinet itself together, thus saving weight and considerably simplifying the construction since it is not necessary to lay out, drill, and tap numerous angle pieces for the corners. The only mounting screws necessary are those bolting the front panel in place.

Hooks are mounted from the eight corners to permit the usual spring suspension which is essential when the set is to be mounted in an automobile or airplane. The leather handle

(which is easily removed when not required) is of convenience when the receiver is being used in the laboratory or is to be carried by hand.

As the set, including all batteries, is well shielded, there is little interference from the stray disturbances caused by the ignition system



THIS PORTABLE RECEIVER IS ADAPTABLE TO ALL SERVICES, INCLUDING AVIATION

It was used as an aircraft receiver during the summer of 1929 on the dirigible "Mayflower" while the ship was at the disposal of the Massachusetts Institute of Technology through the courtesy of the Goodyear-Zeppelin Corporation. The receiver weighs but 12 pounds, ready for service.

of the motor. The only energy of any consequence that can reach the set is that collected by the antenna which, when carefully placed in the car or 'plane, will pick up very little ignition noise.

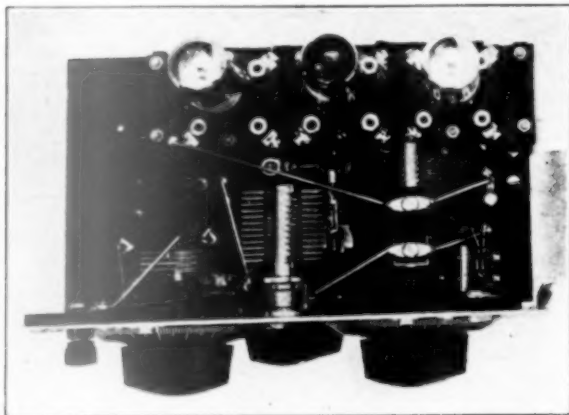
The circuit used is the conventional regenerative detector and two-stage transformer-coupled amplifier. Tuning is accomplished by a small variable condenser shunted by a larger one. This arrangement permits open tuning scales; that is, tuning that is not difficult or critical and yet permits the coverage of a wide band of frequencies without resort to dozens of plug-in coils. The large tuning condenser C_2 has four positions, minimum, maximum and two intermediate positions which are determined experimentally. The intermediate positions are so chosen that the tuning ranges overlap. That is, a signal that is heard with C_2 at a minimum (position 1) and C_1 at 100° can also be heard with C_2 on the first intermediate position (2) and C_1 at the lower end of the scale. Four positions of C_2 permits the adjustment of the

* Contribution from the Round Hill Research (1AXV-1XV).

** Massachusetts Institute of Technology, Cambridge, Mass.

secondary tuning capacity for any value between the combined minimum of C_1 and C_2 and their combined maximum capacity.

The secondary tuning condenser, C_1 , is on the left looking at the front panel; the throttle con-



THE EQUIPMENT ABOVE THE SUB-BASE

From left to right, the variable condensers are secondary tuning (C_1), range-shift (C_2) and regeneration control (C_3). The detector tube is the one next to the inductance.

denser, C_3 , is on the right. The auxiliary secondary condenser, C_2 , is the upper center knob.

The filament rheostat at the lower center of the panel is in the negative filament lead in order that the voltage drop across this resistor ($1\frac{1}{2}$ volts when the "A" batteries are new) may be used as a "C" bias for the amplifier tubes. This detail of wiring provides a "C" bias of very nearly the desired value which greatly decreases the drain on the "B" batteries and gives better amplification. A filament rheostat permits the use of the "A" batteries until the terminal voltage under load has dropped to three volts (the rated voltage of the tubes used) and is, therefore, to be preferred in place of a filament ballast resistor. The filament control jack, which is mounted on a piece of bakelite to insulate it from the panel, is quite essential, as it has been found that during transportation of the receiver it is very easy for the filament rheostat to become turned on, thus causing an undesired drain on the batteries were the circuit not opened by the jack contacts.

When wiring the set it must be borne in mind that one side of the rheostat is probably grounded and must be connected accordingly. Although many points of the circuit are connected to ground or the metal panel, wire connections must actually be made and reliance must not be made on contact through the panel such as is provided

for the rotors of the variable condensers. The radio-frequency circuits were wired with heavy bus-bar wire in order that there would be no movement of the wires caused by vibration if the set were being moved while in operation. This precaution is very necessary since the least movement of these wires would cause the signal to waver both in frequency and intensity.

The grid leak must be connected as shown if the desirable positive bias is to be had for the detector grid. This method of connection could be avoided by connecting the aluminum case and ground to "A plus" instead of "A minus" as shown, but it is good practice for uniformity to always connect the "A minus," "B minus" and "C plus" together and ground this point. This standard practice avoids considerable confusion when numerous receivers and oscillators are in use since it is then known that the battery connections and the polarity of the shields are always alike. It is most annoying to have a shield connected to the "plus A" come in contact with one connected to the "minus A" when a common battery is being used. Connecting the "B minus" to the "A minus" and grounding this point avoids the danger of blowing the tubes should the "B plus" become grounded (the battery is shorted but the filaments are safe).

The tube sockets are mounted on a piece of bakelite the same width as the sockets and just

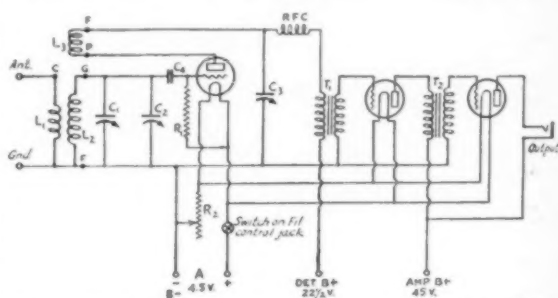


FIG. 1. — THE CIRCUIT OF THE ALL-PURPOSE PORTABLE RECEIVER

L_1, L_2, L_3 — See text and coil table.

C_1 — General Radio 50- μ fd. midget condenser.

C_2 and C_3 — Hammarlund 100- μ fd. midget condensers.

C_4 — Sangamo 250- μ fd. grid condenser with grid-leak clips.

R_1 — 8-meg. grid leak.

R_2 — 45-ohm Carter "Imp" rheostat.

RFC — Sumson type 85 radio-frequency choke.

T_1 and T_2 — Thordarson Type R-151 audio transformers.

The bakelite sub-panel is 5" x 8 1/2" x 3/16" and the bakelite tube-shelf is 2" x 5 1/2" x 3/16".

long enough to hold three. The center portion of this shelf was removed to save weight and to provide a space for the connecting leads to pass

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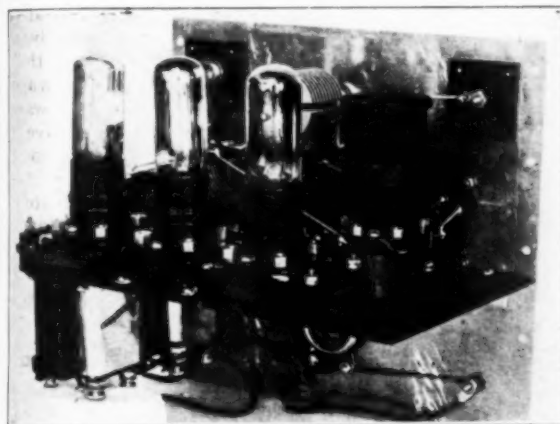
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to the sockets. The tube socket shelf is supported at the ends by sponge rubber which fastens to the under side of the tube shelf and is held clear of the main shelf by small bakelite strips. Connection is made to all the socket terminals by means of small copper braid. This means of mounting and making connections insures the sockets being cushioned from shocks which the carrying case receives.

The ground binding post is mounted directly on the aluminum panel, but a wire connection is made directly to it from the proper part of the circuit. The antenna binding post and 'phone jack are mounted on a piece of one-inch square bakelite and a 3/4-inch hole in the panel is made to clear these parts.

Three 4 1/2-volt "C" batteries are connected in parallel to supply the filaments of the tubes. This "A"-battery supply will give approxi-



THE RECEIVER SANS CABINET

Every inch of available space is utilized. The batteries fit beneath the sub-panel beside the amplifying transformers.

mately 100 hours of service before the terminal voltage of the batteries drops below three volts. The "B"-voltage is obtained from two of the small sized (one pound class) "B" batteries. The five batteries just fit into the space under the sub-panel that is not taken up by the amplifying transformer.

Silver-Marshall type 130-T coil forms are used for the tuning inductances. The constants are as follows:

COIL	A	B	C
Diameter.....	1 1/2"	1 1/2"	1 1/2"
Primary:			
No. turns..	4	6	8
Wire size..	No. 28 d.s.c.	No. 28 d.s.c.	No. 28 d.s.c.
Length of winding..	1/4 inch	3/16 inch	1/4 inch
Secondary:			
No. turns..	8	16 1/2	40 1/2
Wire size..	No. 20 d.s.c.	No. 28 d.s.c.	No. 28 d.s.c.
Length of winding..	3/4 inch	1 1/2 inch	1 1/4 inch

Tickler:	10	15	20
No. turns			
Wire size ..	No. 28 d.s.c.	No. 28 d.s.c.	No. 28 d.s.c.
Length of winding..	In slot	In slot	In slot

FREQUENCY RANGE (KILOCYCLES)

C ₂ in Position 1	12,500-10,000	770-5260	4280-2830
" " 2	10,700-8100	5460-4350	2910-2310
" " 3	8820-7320	4410-3850	2340-1985
" " 4	7700-6670	3850-3410	2040-1795

Midwest Division Convention

Ames, Iowa, May 9th and 10th

ON to Ames, gang — on to Ames! The Midwest Division A.R.R.L. Official Convention and Ninth Radio Amateurs' Short Course, under the auspices of Iowa State College, will be held this year as usual at Ames on the 9th and 10th of May. Technical talks on all phases of amateur work will be given by one of the editors of QST, and F. E. Handy, Communications Manager, A.R.R.L., and author of the Radio Amateur's Handbook. F. H. Schnell, "the Ace of Radio" and Chief of Staff for the Radio & Television Institute of Chicago, will also be one of the principal speakers — and he always has something good to say. Other prominent speakers will be Prof. Carl Menzer, University of Iowa; Prof. J. K. McNeely of Iowa State College; Prof. C. M. Jansky, Jr., of Washington, D. C.; Mr. P. C. Rawls of the Technical Equipment Co., Des Moines, as well as Messrs. J. W. Doty and A. E. Rydberg of KOIL, Council Bluffs.

Registration will begin at 9:00 a.m. on Friday in the Engineering Building, Iowa State College. A change is being made this year — and that is the banquet will be held on Saturday evening, and boy! it's going to be some explosion. On to Ames, gang — on to Ames!

Hudson Division Convention

New York City, May 23 and 24

HEAR ye, Hudson Division "Hams," the call for our annual convention, to be held at the Hotel Pennsylvania, New York City, on May 23rd and 24th. Director Walsh is sponsoring the affair and has appointed Mr. A. B. O'Hara, Chairman, and Mr. Dave Talley, Treasurer. As in the past there will be plenty of good talks and entertainment during the two days, ending with a banquet on Saturday night which will satisfy everybody. Drop a line to Director A. L. Walsh, 220 West 42nd Street, New York City, and make your reservation.

Official Frequency System

THE Official Frequency Station Committee, a part of the Experimenters' Section of the A.R.R.L., has arranged the services described below for the benefit of the members of the League and others who may wish to use them.

1. Standard Frequency Transmissions are sent by the Standard Frequency Stations W9XL and W1AXV (known as O.F.S.-S.F.) on definite schedules with a high degree of accuracy. All the principal amateur bands are covered, several points being given in each so that frequency meters may be accurately calibrated.¹

These transmissions are based on piezo-electric frequency standards. The standard used by W9XL is checked at intervals by the Bureau of Standards at Washington. That used at W1AXV is checked against the standard time interval in the M. I. T. laboratory at Round Hill.

2. Official Frequency Transmissions are sent by Official Frequency Stations (known as O.F.S.) at a somewhat lesser degree of accuracy. These stations do not transmit on regular schedules but announce their frequency at the end of at least every other transmission during their regular amateur operation. Such stations will measure the frequency of your transmission upon request.

Practical suggestions are always welcome and should be sent to the proper member of the Committee which is composed of the following: Don C. Wallace, W6AM, Chairman in charge of O.F.S., Room 410, 209 Pine Ave., Long Beach, Calif.; Prof. C. M. Jansky, Jr., care of University of Minnesota, Minneapolis, Minn.; and Killian V. R. Lansingh, W6QX, in charge of O.F.S.-S.F., Box 666, Hollywood, Calif.

STANDARD FREQUENCY SCHEDULES

Friday Evening Schedules Friday and Sunday Afternoon Schedules

Time (p.m.)	Frequency, kc.	Time (p.m.)	Time (p.m.)
A	B	AB	BB C CD
8:00	3500	7000	7000
8:12	3550	7100	7100
8:24	3600	7200	7200
8:36	3700	7300	7300
8:48	3800	....	3500
9:00	3900	....	3650
9:12	4000	....	3850
9:24	....	....	4000
4:00	7000	14,000	3:00 28,000
4:12	7100	14,100	3:12 29,000
4:24	7200	14,200	3:24 30,000
4:36	7300	14,300	3:36 14,000
4:48	....	14,400	3:48 14,200
			4:00 14,400

The time is the local standard time at the transmitting station. 8:00 P.M. at W1AXV is 0100 G.C.T. and 8:00 P.M. at W9XL is 0200 G.C.T. Similarly, 4:00 P.M. at W1AXV is 2100 G.C.T. and 4:00 P.M. at W9XL is 2200 G.C.T.

¹ See "Utilizing Standard Frequency Transmissions," QST, Sept., 1929.

DATES OF TRANSMISSION

Date	Schedule	Station
May 2, Friday	A	W1AXV
" 4, Sunday	CD	W9XL
" 9, Friday	BB	W1AXV
" 9, Friday	AB	W9XL
" 16, Friday	B	W1AXV
" 23, Friday	AB	W9XL
" 25, Sunday	C	W1AXV
June 6, Friday	A	W1AXV
" 13, Friday	BB	W1AXV
" 20, Friday	B	W1AXV
" 29, Sunday	C	W1AXV

As explained elsewhere in this issue of QST, W9XL will not transmit schedules during June.

Schedule "BB" sent at 2100 G.C.T. on one Friday of each month is transmitted at that hour for the particular benefit of European stations. If sufficient reports on its reception are not received, it will be discontinued.

THE STATIONS

W1AXV: Massachusetts Institute of Technology, Communications Department Experiment Station, Round Hill, Dartmouth, Mass., H. A. Chinn in charge. Uses Eastern Standard Time and characteristic letter "G."

W9XL: Northwestern Broadcasting, Inc., R. F. D. No. 3, Anoka, Minn., H. S. McCartney in charge, assisted by Lyall K. Smith, Ivan H. Anderson and George Collier. Uses Central Standard Time and characteristic letter "D."

DIVISION OF TIME

A total of 12 minutes is allotted to each transmission divided as follows:

4 minutes — QST QST QST de (call letters).
3 minutes — Characteristic letter ("G" or "D") sent very slowly and broken by call letters each half minute.

1 minute — Statement of frequency in kilocycles to nearest integral figure.

4 minutes — Time allowed to change to next frequency.

ACCURACY

The transmissions of both stations will be within 1/10 of 1% of the frequencies herein announced, which is considerably better than the accuracy to which the average good amateur frequency meter can be calibrated and maintained constant. During each transmission by W1AXV the integral frequency nearest its exact frequency within 1/100 of 1% will be announced for the benefit of those able to use such accuracy, but for all general amateur purposes the frequency of transmission of both stations may be assumed equal to the figures as herein given.

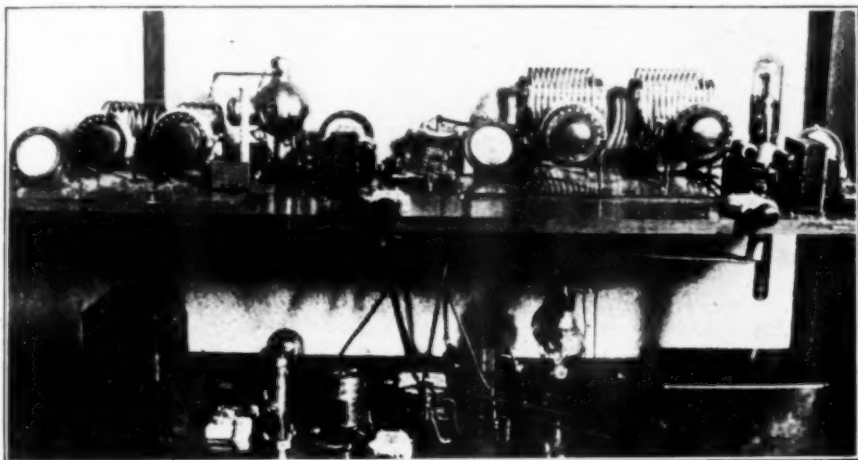
(Continued on page 74)

The All-Section Sweepstakes Contest

By E. L. Battey, Assistant to the Communications Manager

WITH shouts of, "On ye Brave; Who rush to glory, or the grave!" the starting pistol was fired at 0000 G. C. T. on January 18, and the All-Section Sweepstakes Contest was under way. The participants looked to the two weeks ahead of them and wondered. . . . They knew of the great possibilities of the contest; they knew of the possible high scores; they knew of those three unique trophies set aside for the leaders; they

Each received message counted one point, and each transmitted message one point, making a score of two points for each QSO, if a message had been successfully transmitted and received. It was possible, therefore, to score *two* for every QSO, but the scoring did not stop there. Whatever total score was made by exchanging messages was multiplied by the *number of sections* with which messages had been exchanged. As there are 68 sections, there was a possible multi-



W1ADW, WINNER OF SWEEPSTAKES CONTEST

knew of the very attractive brown lithographed certificates awaiting the winners in the sixty-eight A.R.R.L. sections; they knew . . . but let us glance at the rules of the contest as outlined in December QST. . . .

The Sweepstakes Contest, which was, in effect, the first National Relay Contest, was open to all amateurs in each of the 68 A.R.R.L. sections throughout the United States and Canada, and including Hawaii, Alaska, P. I., Porto Rico, Cuba, etc. Participants were allowed to exchange but one message each way with a station for credit in the contest, but were permitted to exchange messages with as many stations as possible. Messages had to be transmitted in complete form with city of origin, station of origin, number, date, address, text, and signature, the text being of no less than ten words (plain language count). Messages that did not comply with this rule were designated incomplete, and likewise the QSO on which they were exchanged was eliminated from the contest.

plier of 68. Think what that meant!! There was no limit to the possible scores!

And now the two weeks of the contest are a memory, the award committee has completed its tedious task of checking over the logs submitted, and we are ready to present the results. W1ADW made the "clean sweep" with his score of 13,158, and wins first prize!! He swept the air with a signal from a Hi-C Hartley, using an 852 part time, and a UV-203-A for the remainder of the contest. Messages were exchanged with 153 stations in 43 sections on the 3500-, 7000- and 14,000-ke. bands. We secretly suspect that W1ADW is now making up a little lost sleep after that splendid piece of work! W9DEX claims the second prize by virtue of exchanging messages with 142 stations in 43 sections for a score of 13,212! Work at W9DEX was carried out with a single Type '10 on the 3500- and 14,000-ke. bands. It is interesting to note that both W1ADW and W9DEX succeeded in chalking up 43 sections to

their credit. Close on W9DEX's heels is W2BAI with a score of 12,090 made by swapping messages with 155 stations in 39 sections! W2BAI did not enter the contest until January 24, a week after the start, but he worked hard, and the third prize is his. He used the 7000- and 14,000-kc. bands. WIADW, W9DEX and W2BAI are all one-man stations and in view of this we realize how the operators must have stepped to run up the scores they did. Our hats are off to them!

At this point let us review the contest from the participants' angle and discuss the various points brought out by those who took part. The outstanding difficulty encountered by all was the educating of other amateurs in the whys and wherefores of the contest. Practically every contestant who made any comment at all on the competition mentioned that he found it pretty tough sledding to get a message out of most stations. In about three out of every five cases it was necessary to explain what the contest was all about, what was necessary before points could be counted, that it was not necessary to enter beforehand, etc., etc., and much time was lost by all this explaining. But why all the doubt and uncertainty and seeming ignorance of the existence of the contest? Surely it was not because it had come unheralded. The December issue of *QST* contained a complete explanation and list of rules, and the January number announced the trophies and certificates to be awarded to the winning stations. So much was said in *QST* that every amateur should have had at least a fair conception of the contest. Why then . . . ?? Yes, you have hit the nail on the head — "Amateurs do not properly read *QST*." This newest complaint, mentioned in the I.A.R.U. Section of January *QST*, has been confirmed to the "nth" degree in the Sweepstakes Contest. It is truly astounding to learn how many fellows, who say that they "read *QST*," are found absolutely "in the dark" when a contest such as we are recounting comes along. But let's move on and see what else we can find out about the contest. There was a certain group, but fortunately a much smaller one than the "non-readers," that took a rather indifferent attitude toward the whole affair. Not being actively engaged in or interested in contest work themselves, they had to be persuaded a lot before they would come through with a message. Many actually refused to have anything to do with the contest. Did those fellows stop to think that five minutes spent in an exchange of messages would help the other man in his efforts to run up a good score, and at the same time make the QSO more interesting, and give both operators practise in message handling, which by the way, is what most of the "indifferent" amateurs need? WIWV sums up the poor spirit of the "indifferent group" quite effectively when he says, "In looking back over all the various experiences I had in the Contest, I couldn't help but think

what a millennium it would be if all amateurs would practise the Golden Rule."

Then there were the fellows who were perfectly willing to exchange messages but, when asked to, were lost because they had no idea of how to properly send even a simple message. We won't say anything further about this group. They know their faults! All in all the contest certainly showed up many shortcomings in operating and in operators.

It will be well to point out several misapprehensions regarding the rules of the contest. No rule was set forth whereby it was necessary that a contacted station be actually participating in the contest but, nevertheless, many assumed that this must be so and consequently passed up many valid points. Some participants thought it was necessary that stations contacted send Headquarters copies of the two messages exchanged as an additional check on the QSO before any points would be counted, although nothing was said in the rules to this effect. A few over-cautious souls believed that logs and messages had to be submitted on standard A.R.R.L. forms and that a careful check would be made to eliminate any points made with a non-member of the League. We are certainly sorry that such misunderstandings came up, but we see little excuse for them. In any contest it is always safe to follow the rules as they are written. If you do this, you cannot go far wrong!

Now that we have bared the unfortunate sides of the contest, let us see what we can dig up on the "sunny side." That the contest was enjoyed by those who took part is clearly evident from the comments made by contestants in reporting their scores. WSAQ (ex-1AAC), an old-timer, says, "I enjoyed it more than any contest in years." W9GKI remarks, "Believe contest was very good dope and got a kick out of it. . . . I'm for more like it."

Many participants made similar comments, and the cry for another "National Contest" is now in the air. Many amateurs got some much-needed practise in message handling, and we dare say that there are now a number of individuals who have the Sweepstakes Contest to thank for their knowledge of proper operating procedure. A better conception of the A.R.R.L. sections was obtained by most contestants, and many were able to work sections they had never even heard before.

One of the outstanding good points of the Sweepstakes Contest was the fact that the fellow with low power was at no great disadvantage, and was able to strut his stuff with the best of them. WSAQ, the certificate winner in the Western Pennsylvania section, ran up his score using only 180 volts of "B" batteries on a Type '01-A! W6CTP, second high in the San Diego section, used a Type '12-A with 300 volts r.a.c. W9ACU boosted the Illinois total to the tune of 1680

points with a Type, '71-A fed by 175 volts of "B" bats. The high- and low-power stations ran neck and neck in this contest.

There was one station at least which used 'phone during the contest. This was W9GHI in Baldwin, Kansas. His score of 2592 was made to a large extent on 3500-ke. 'phone. Good work, W9GHI.

The choice of frequencies is an important factor in every contest, and it is interesting to note which frequency bands proved most popular in this contest. All participants either confined their efforts to the 3500-, 7000- or 14,000-ke. band, or divided their time on these three bands. Out of 90 stations reporting totals, 22 worked on both the 7000- and 14,000-ke. bands; 22 worked on 7000 ke. only; 17 pounded away on all three bands; 15 used the 3500- and 7000-ke. channels; 6 did all their work on 3500 ke.; 4 preferred the 3500-14,000-ke. combination; and 4 operated on 14,000 ke. only. It is surprising to note the number of stations successfully working the 7000-ke. band, especially when this band is so loudly proclaimed "QRM headquarters." Can this band be so bad after all?

The scores of the various contestants and sections are given at the close of this write-up. They are listed according to the standing of each section, and each participating station within the section. There are 48 sections represented. Certificates will go to but 46 of these sections, as no station in the other two sent in a report in accordance with the rules. Stations marked with an asterisk were not actually taking part in the contest and did not submit a score. They merely sent in the messages they exchanged to be checked and counted on participating stations' scores. The award committee has given them a score, however, and although they are not eligible for prizes, their scores are credited to their respective sections.

It is with much regret that we must record the disqualification of one participating station. It was stated most clearly in the rules that "the date and time acknowledged" must be noted on every message. W7AC would have had a pretty score of 1680 points had he not slipped up and failed to record the time the exchanges were made. We eliminate this station only out of fairness to the other participants who were more accurate and submitted satisfactory proof of their various two-way communications in line with the Contest rules. A very few contestants were reported by Official Observers as working off-frequency during the contest, but as two off-frequency reports were deemed necessary by the irregularities committee to constitute a disqualification, we are pleased to report that no participants in the

Sweepstakes Contest were eliminated because of off-frequency operation. No more than one off-frequency report was received for any station.

It will be noted that the three leading sections also boast the three "high stations" for the country: W1ADW, W9DEX and W2BAI respectively. It is also well to observe that the certificate winner in almost every section is a well-known traffic man. Many are League officials. W1WV, winner in Eastern Massachusetts, is the SCM of that section; W9ERU, Illinois victor, is Route Manager for his section; K4KD, who takes the



HERE IS ONE OF THE CERTIFICATES

honors for Porto Rico, is SCM of the Porto Rico-Virgin Islands section; W6WB, another winner, is SCM of the San Francisco section. Up in Canada VE2AC, SCM of Quebec, takes the certificate for the Quebec section. The New Mexico certificate goes to the SCM of that section, W5AHL. Likewise, the SCM of Montana, W7AAT, walks away with the certificate out there. A glance at the list of winners will reveal many more equally active brass pounders.

And now for the scores —

SWEEPSTAKES CONTEST SCORES

Section	Station	Score	Section Score
Connecticut	W1ADW	13,158	
	W1MK	5,976	
	W1UE	494	
	W1VZ *	2	
	W1APZ *	2	
			19,632
Iowa	W9DEX	12,212	
	W9EOP	60	
	W9ARW *	2	
			12,274
E. New York	W2BAI	12,090	12,090

E. Massachusetts	W1WV W1DS W1AAT W1RV W1TL W1AU *	5,270 2,254 480 128 84 4	W. Pennsylvania	W8APQ W8DLG W8DP1 * W8DNO *	1,224 966 50 2	
			Santa Clara V.	W6YU W6BYH W6DQH	1,044 936 48	2,242
Kansas	W9CCS W9GHI W9GDH	4,620 2,592 684				
			North Texas	W5AFM W5AMK *	1,760 8	2,028
Illinois	W9ERU W9BSH W9ACU W9FCW W9QI * W9AFN * W9ANQ *	2,704 2,640 1,680 264 32 2 2				
			Los Angeles	W6AM W6ETJ	1,360 342	1,768
			San Francisco	W6WR W6ERK W6CIS *	1,426 224 2	1,702
Ohio	W8AQ W8CFL W8NP * W8AFS * W8BUS	6,786 280 128 18 12				
			E. Pennsylvania	W3BQV W3MZ W3CGS	1,584 18 2	1,632
			W. Massachusetts	W1AZW W1BKJ W1ZB W1CNE * W1SW *	800 704 50 16 2	1,601
New York C.-L. I.	W2CUQ W2AYM W2BST	5,568 180 27				
			Saskatchewan	VE4IH	1,540	1,572
Ontario	VE3BK VE3BC VE3ZZ VE3ET VE3DA	3,186 768 560 546 300				
			Wisconsin	W9FAW	992	992
			Quebec	VE2AC	950	950
Porto Rico-V. I.	K4KD	5,180				
			Oklahoma	W5ZAV	950	950
Michigan	W8BGY W8DYK W8PP W8LA	4,248 476 384 8				
			Missouri	W9CJB W9DQN W9BMU *	924 18 2	
			New Mexico	W5AH1 W5AJL	330 112	944
Oregon	W7AJW W7ACH W7AHX W7WR	4,032 506 126 8				
			So. New Jersey	W3UT	416	442
			San Diego	W6EPZ W6CTP W6BYP *	300 98 2	416
Utah-Wyoming	W6DPJ W7AAH	3,392 972				
			Alabama	W4AG	312	400
North Dakota	W9BVF W9DGS	2,704 1,560				
			Virginia	W3ARU	286	312
Washington	W7GP W7FA W7ACS W7AJH *	3,648 260 176 2				
			Indiana	W9GKI	240	286
			So. Minnesota	W9GGA W9BN *	176 32	240
			North Carolina	W4FT *	200	208
W. New York	W8DSP W8QL W8BJO W8CMW *	1,880 608 336 32				
			Ga.-S. C.-Cuba-Isle of Pines	W4SS	176	200
			New Hampshire	W1IP	144	176
West Virginia	W8IB	2,392				144

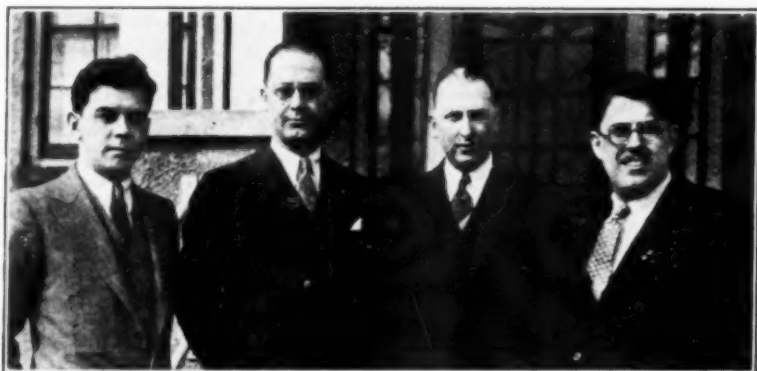
(Continued on page 76)

Changes in A.R.R.L. Standard Frequency Service

W1AXV to Give Individual QRG Service—W9XL to Discontinue Schedules

IN keeping with the A.R.R.L. policy of a greater and more accurate frequency calibration service to amateurs, Standard Frequency Station W1AXV will supplement its regular standard frequency broadcasts with a direct frequency checking service to individual

"The procedure, then, will be as follows: "One hour before our regular S.F. schedule we will call 'CQ de W1AXV QGG? AR.' Two operators — using separate receivers — will listen for replies. As soon as a station is heard calling W1AXV, his frequency will be measured and



W9XL'S STANDARD FREQUENCY CREW

In addition to their regular duties on the technical staff of WCCO, they have been handling the Standard Frequency Transmissions of W9XL since 1926. Starting at the left, meet Ivan H. Anderson, engineer in charge of WCCO's transmitter at Anoka; Hugh S. McCartney, the station's chief engineer; Lyall K. Smith; and George Collier.

amateur stations. This new service should have a marked effect in clearing up off-frequency operation. Needless to say, it has the hearty approval of the O. F. S. Committee.

As described by Mr. Howard A. Chinn, who is in charge of W1AXV at the Round Hill Research Division of the Mass. Inst. of Technology, Round Hill, South Dartmouth, Mass., the frequency checking service will operate as follows:

"During the hour preceding each standard frequency broadcast from W1AXV we will work as many amateur stations as possible and measure their transmitted frequency for them. The precision of the measurement will be better than 0.1 per cent in all the amateur bands. Our transmitter will be adjusted to the frequency of the first standard frequency scheduled for transmission during the following hour, but we will listen for replies throughout that band.

"In order that amateurs may know that we are on the air to give this service, I suggest the new 'Q' signal, 'QGG:— Do you wish your frequency measured?'

upon answering him we will give him his QRG.

"Meanwhile, the other operator will be listening for other stations and immediately the transmitter is free he can work any station he has heard calling us. Therefore, stations can call us although we are in communication with someone else. It will be necessary for the successful functioning of the service, however, that stations desiring a frequency check have patience and stay with us until we can answer them.

"Our only request is that upon receiving his QRG, no matter how far away or close by he may be, the station drop us a line acknowledging the service in order that we shall have something in our files to show for our efforts."

W1AXV will also act as an Official Observing Station and notify stations heard operating off frequency. After a station has been warned once and is again heard operating off frequency, his call will be reported to A.R.R.L. Headquarters.

Now this direct service from W1AXV means more than may appear at a casual glance. The

(Continued on page 76)

Experimenters' Section

A SIMPLE METHOD OF CHECKING MODULATION PERCENTAGE

THE determination of the percentage of modulation on a 'phone transmitter is of as much interest and value to the amateur as to the broadcast engineer, because it is an index of the effectiveness of the set. As has been previously pointed out in *QST*, the higher the modulation factor (within the modulation capability of the transmitter), the greater will be the voice range as compared with the interference range of the carrier. A high percentage of modulation therefore helps the 'phone man in two ways: The possibilities of a given amount of apparatus are more fully realized, and the quantity of incidental interference is greatly reduced.

There are several methods available for measuring the modulation factor, a peak vacuum-tube voltmeter, such as the Modulometer described in August, 1929, *QST*, being about the most satisfactory. However, for the amateur who does not have the necessary equipment for such a device and who will be satisfied with an approximation of fair accuracy, less complicated and more easily applied methods may be used. One of these, requiring only the use of a thermo-galvanometer or low-scale thermo-ammeter, has been called to our attention by Mr. G. Willard Ray, of Hamden, Conn., who writes as follows: "I believe the following will be of interest to our radiophone friends, in case they wish to compute percentage of modulation in their transmitters.

"The only piece of apparatus required is a current-squared thermo-galvanometer and a length of stiff copper wire. Make a few turns of the copper wire, and connect it across the meter, coupling loosely to the output of the transmitter, so that the instrument reads about half scale with the carrier on but unmodulated. Then talk into the microphone and the galvanometer will deflect if there is any modulation at all. Its maximum deflection point with regard to its original reading will tell the tale, thus:

$$\% \text{ modulation} = 100 \sqrt{2(R-1)},$$

where R equals the ratio of maximum to minimum readings, i.e., scale reading of the galvanometer with modulation divided by the scale reading without modulation.

"As an example, suppose we arrange the meter and coupling loop so that the scale reading is 40 degrees when not modulating and suppose it climbs to 60 degrees at peak modulation. R then equals 1.5, and we have

$$\begin{aligned} \% \text{ modulation} &= 100 \sqrt{2(1.5-1)} \\ &= 100 \times 1 \end{aligned}$$

or 100% modulation

"I use this method for actual computation at WICC and know that it is well worth trying. It can even be used with the usual old-fashioned wavemeter equipped with a thermo-galvanometer."

A simple calculation indicates that when R equals 1.5, the transmitter is being modulated 100%. Therefore the transmitter should always be adjusted so that R is never greater than 1.5, as distortion is sure to result.

The above formula is based on the use of a meter which reads current squared. The method may be used with an ordinary low scale meter calibrated to read current by slightly rearranging the equation. It then becomes:

$$\% \text{ modulation} = 100 \sqrt{2 \left(\frac{I_2^2 - I_1^2}{I_1^2} \right)}$$

where I_1 = current when carrier is unmodulated
 I_2 = current when carrier is modulated.

In using this method it is well to keep in mind the fact that the needle of the meter takes an appreciable time to reach its maximum position. For this reason a sustained note should be sung into the "mike" until the pointer takes a steady value. If another person can be pressed into service to do a little listening in the monitor the

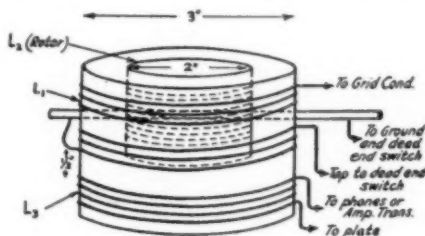


FIG. 1

L_1 — Stator, 6 turns of No. 20 c.c.c.

L_2 — Rotor, 9 turns of No. 20 d.c.c.

L_3 — Tickler, 4 turns of No. 24 d.c.c. placed $\frac{1}{2}$ " from L_2 .

All coils are wound without spacing between turns, except where the shaft passes through the middle of L_2 and L_3 . L_3 may be wound without spacing and placed entirely above the shaft if desired.

point at which distortion becomes objectionable can be determined. The gain control should be increased until just below the point at which distortion becomes noticeable. Then sing into the microphone at the same voice intensity as used in the voice test, and the maximum modulation factor (with those particular transmitter

adjustments) can be easily calculated as outlined above.

Readers interested in the derivation of the above formulas, are referred to an article on "The Power in a Modulated Oscillator," by E. Howard Robinson, in the May, 1928, issue of *Experimental Wireless & the Wireless Engineer*, a British publication.

A USEFUL AMATEUR TUNING ARRANGEMENT

The tuning unit developed in the Burgess laboratories, described in February, 1930, *QST*, has stirred up quite a bit of interest in the amateur world, with the natural result that some of our construction enthusiasts have been building their own version of it.

Robert T. Foreman, W9ZZE, has worked out a successful tuner and is quite pleased with the ease of tuning and the elimination of the large number of plug-in coils necessary to cover the same tuning range in the commonly used type

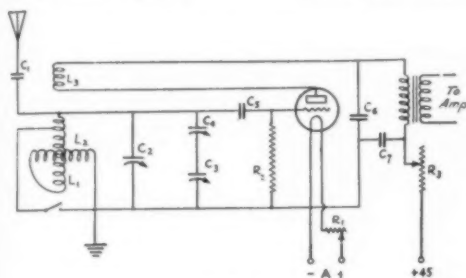


FIG. 2

L_1, L_2, L_3 — See Fig. 1.

C_1 — Antenna coupling condenser, may be variable 5-plate midget or made by placing two small brass angles facing each other.

C_2 — 100 μ fd.

C_3 — 100 μ fd.

C_4 — 100 μ fd., preferably s.l.f.

C_5 — 100- μ fd. grid condenser.

C_6 — 1000 μ fd. (not critical).

C_7 — 1 μ fd.

R_1 — Filament rheostat suitable for tube used.

R_2 — 2-megohm grid leak.

R_3 — 50,000-ohm variable resistor.

of receiver. No special apparatus is required, and the bands may be spread to any desired degree.

The variometer is shown in Fig. 1. All three coils are wound in the same direction. The various connections are marked on the drawing. If metal rods are used to support the rotor, and also form the end connections of the coil, it is important that the shaft on which the dial is mounted be connected to ground, to eliminate body capacity effects. In the event that some hand capacity is present even with the connections as shown, a small copper or aluminum shield a few inches square mounted on the back of the panel, and connected to the shaft, will reduce it to a minimum.

This unit with the condensers specified in the diagram, Fig. 2, covers the band of frequencies between approximately 10,000 kc. and 3400 kc., with the switch open. When the switch is closed, the range is from 17,000 kc. to 8000 kc.

The tuning is done as follows: Set C_4 at minimum capacity and adjust the variometer and C_2 until the highest frequency desired at that particular portion of the spectrum is tuned in. The next step is to set C_4 at maximum, then vary C_3 until the receiver is tuned to the lowest frequency wanted. Obviously a large number of different settings of the condensers and variometer will give the same frequency as both inductance and capacity are variable. In general, it is best to use as much inductance and as little capacity as possible for maximum signal strength. These settings may be made by using "marker" stations of known frequency or with the help of a frequency meter or calibrated monitor. It is a good idea to keep a record of the best settings determined by experimenting as above for the more popular bands so the tuner can be readily reset without loss of time.

As an illustration, suppose we want to cover the 7000-kc. band with a little overlap on each side, or from 6900 to 7500 kc., for instance. Set C_4 at minimum capacity, no particular attention being paid to C_3 , because its capacity is so large compared to C_4 that it will have comparatively little tuning effect on the circuit when C_4 is at minimum. Then adjust the variometer and C_2 until the 7500-kc. frequency is tuned in. If a station is heard at about this frequency, different settings of both may be tried until maximum signal strength is obtained. With these settings definitely determined, set C_4 at maximum and vary C_3 until 6900 kc. is reached. The band spread may be made as large or small as desired by varying C_2 and C_3 slightly.

It is best to mount C_3 behind the panel and use an insulating extension shaft for varying its capacity, because both sets of plates are at high r.f. potentials and hand capacity will be annoying if mounted in the usual manner.

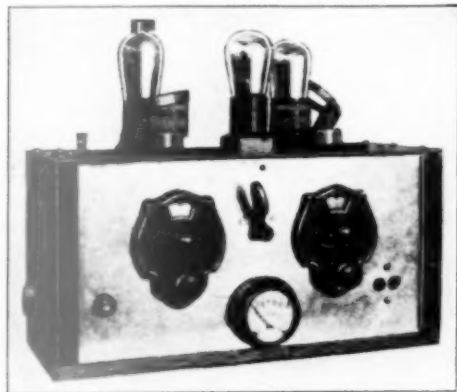
NOVEL RECEIVER AT W9AIR

It seems that the problem of rapidly changing from one band to another on a receiver has been receiving quite a bit of attention lately. Herman Radloff, W9AIR, suggests the method shown in Fig. 3, and has found it a convenient arrangement for shifting between two bands.

Two separate sets of coils and condensers are incorporated in the receiver, each covering a different amateur band. A four-pole double-throw switch serves to transfer the detector tube from one tuning range to the other. The photograph shows how the apparatus is laid out. Plug-in coils wound on tube bases are employed, so that by changing coils any two of the amateur

bands may be used at will. The antenna coils are not interchangeable, but the coupling can be varied by means of a pivoting arrangement, these coils being directly over the tube-base coils in the photograph.

Condenser C_1 is not used as a tuning condenser, but is used simply to allow the fixed capacity in the circuit to be adjusted. This is an advantage when the bands are spread over most of the dial, because changing the detector tube



RECEIVER AT W9AIR

often causes the tuning to change so markedly that only a portion of the band can be covered. This in turn requires alterations to the tuning coil unless there is some way of compensating for changes in tube capacity. Aside from the above feature, however, C_1 could be omitted entirely.

C_2 is adjusted by removing plates until the 3500-ke. band is spread over the dial scale. When this condition is attained, it will also cover the

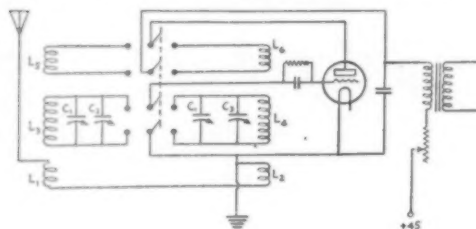


FIG. 3

- L_1, L_2 — Fixed antenna coils.
 L_3, L_4, L_5, L_6 — Plug in coils wound on tube bases for different bands.
 C_1 — 50- μ fd. midjet condenser.
 C_2 — 50- μ fd. midjet with plates removed to cover the 3500-ke. band.
 C_3 — 50- μ fd. midjet with plates removed to cover the 7000-ke. band.

1750-ke. band very satisfactorily with the proper plug-in coil. C_3 is adjusted in the same manner to spread the 7000-ke. band, and also works out nicely for 14,000 ke. No data is given on the

coils, as these differ in no way from those used in the ordinary receiver.

Since the majority of amateur stations seem to work in only two bands regularly, a change-over idea of this type will no doubt be found useful.

TUNING THE OSCILLATOR TO THE SINGLE-WIRE FEED HERTZ ANTENNA

In using the single-wire feed Hertz there is always danger that the antenna and feeder will act simply as a grounded Marconi antenna unless the oscillator is tuned exactly to the fundamental or a true harmonic of the antenna. Getting the tuning exactly right is always a problem, even though the exact length of the antenna is known, because local conditions appear to have some influence on the fundamental.

An easy method of finding the correct oscillator frequency has been suggested by Mr. Paul E. Griffith, W9DBW. It requires the use of a monitor. The method is based on the fact that the reactance of an antenna is capacitive below its fundamental frequency and inductive at higher frequencies than the fundamental.

The oscillator is first tuned to approximately the supposed fundamental of the antenna, with the feeder disconnected. The monitor should be

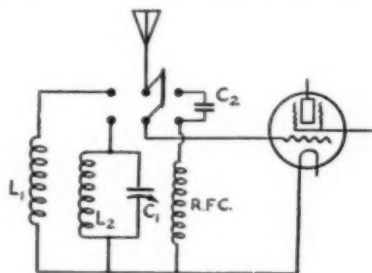


FIG. 4

- L_1 — Antenna coil.
 L_2 — Tuning coil for band used.
 C_1 — Tuning condenser for band used.
 C_2 — Antenna coupling condenser.
RFC — Radio Frequency choke suitable for operating frequency.

tuned to zero beat and the dial setting noted. The feeder is then clipped on the inductance, and the change in frequency, if any, noted. If the second frequency is higher than the first, the oscillator frequency is too high. If the second frequency is lower the oscillator frequency is too low. The oscillator frequency should, therefore, be raised or lowered, as the case may be, until clipping the feeder on the tank coil makes no difference in the frequency, as indicated by the monitor, at which point the oscillator and antenna will be in resonance.

W9DBW also points out that once the correct frequency is determined, an ammeter may be

placed in the center of the antenna and the position of the feeder clip adjusted until maximum current flows, the oscillator frequency of course being unchanged during these adjustments. This is *not* the same thing as varying the frequency of the oscillator until the meter gives a maximum reading. Such a practice will result in a distorted wave form on the antenna, as explained in September, 1929, *QST*, and will reduce the actual radiation.

FURTHER SWITCHING DEVICES

The advantages of tuned r.f. amplification are well known, but most amateurs have preferred to use an untuned stage to avoid tuning com-

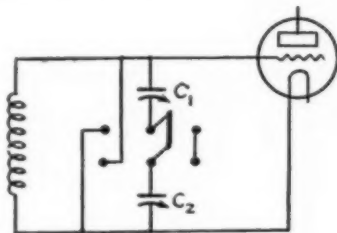


FIG. 5

Tuning condensers may be put either in series or parallel by installing a switch as shown.

plications. By means of a simple switching arrangement suggested by Gilbert J. Dutton, of Chicago, Ill., either tuned or untuned r.f. may be used at will.

Fig. 4 shows the system used by Mr. Dutton. In this case, the receiver uses an antenna coupling coil, necessitating the use of a double-pole double-throw switch. If the coupling is made capacitive for both tuned and untuned r.f. amplification, a single-pole double-throw switch will suffice. A resistor may be substituted for the radio frequency choke if desired.

Fig. 5 shows another switching arrangement suggested by Mr. Dutton which should interest those using series tuning condensers for band spreading. When the switch is thrown to the right, the condensers are in series, the setting of C_1 then being fixed at a point which allows the spread to be spread properly on the dial of C_2 , which serves as the tuning control. With the switch thrown to the left, the two condensers are in parallel, and either may be used for tuning. If the capacity of C_2 is several times as large as that of C_1 , the latter can be employed as a vernier. With such a switch it is possible to cover both the broadcast and amateur bands with suitable plug-in coils, and the spread may be made as large or small as desired. Suggested values would be 50 $\mu\text{fd.}$ for C_1 and 350 $\mu\text{fd.}$ for C_2 .

BIBLIOGRAPHY ON CRYSTAL CONTROL

More and more amateurs are using crystal-controlled oscillators. This is a good sign, although it should be realized that the mere use of a crystal in the oscillator is not a cure for all transmitter troubles. For instance, the frequency of a crystal-controlled oscillator depends upon the voltage and current at which the oscillator tube operates, the tube capacities, the temperature of the crystal, and the spacing of the electrodes in the crystal holder. The importance of temperature control, correct crystal holders, the proper oscillator tube operating at normal or reduced plate voltage and current, and the advisability of *calibrating the crystal under actual conditions encountered in practice*, have not been given sufficient serious attention. Simply inserting a quartz plate will not cure all transmitter troubles; it may not even guarantee to keep your signals in the amateur band.

The following bibliography on crystal control will, it is hoped, be useful to those amateurs who are using or are contemplating the use of crystal control.

QST REFERENCES:

- Crystal Oscillators, Experimenters' Section, p. 35, January, 1925.
- Oscillating Crystals, Experimenters' Section, p. 35, August, 1925.
- Crystal Control for Amateur Transmitters, Clayton, p. 8, November, 1925.
- Navy Developments in Crystal-Controlled Transmitters, p. 41, November, 1925.
- Crystal Control, Taylor, p. 62, December, 1925.
- Crystal Control at 4XE, Lee, p. 251, January, 1926.
- Practical Crystal-Controlled Transmitters, p. 21, January, 1926.
- Crystal Cutting, Mason, p. 59, February, 1926.
- Neutralizing the Crystal Amplifier, Clayton, p. 36, March, 1926.
- Adjusting the Crystal-Controlled Transmitter, McMinn, p. 43, May, 1926.
- A Multi-Stage Crystal-Controlled Transmitter, Wells and Tillyer, p. 29, June, 1926.
- Quartz Crystal Mountings, Clayton, p. 15, July, 1926.
- A 20-40-80-Meter Crystal-Controlled Transmitter, Root, p. 33, August, 1926.
- Looking at Quartz, Eshelby, p. 52, November, 1926.
- Low-Power Crystal-Controlled Transmitters, J. M. Clayton, p. 14, January, 1927.
- Quartz Crystal Mounting, Clayton, p. 27, February, 1927.
- A D.C.-A.C. Crystal-Controlled Transmitter, Clayton, p. 31, February, 1927.
- A Method of Grinding Quartz Plates, Mueller, p. 24, May, 1927.
- A Flexible Crystal Transmitter, Glaser, p. 18, June, 1927.
- Another View of Crystal Control, Kruse, p. 41, July, 1927.
- An Oscillating Amplifier for the Crystal Transmitter, Pierce, p. 15, October, 1927.
- Full-Wave Self Rectification and Crystal Control, Schnell, p. 33, November, 1927.
- Grinding of Quartz Plates, Watts, p. 27, January, 1928.
- A Crystal Grinder, Mason, p. 37, May, 1928.
- A Portable Crystal-Controlled Transmitter, Angus, p. 33, October, 1928.
- A 28-Megacycle Crystal-Controlled Transmitter, Chinn, p. 29, November, 1928.
- Debunking Crystal Control, Hollister, p. 35, December, 1928.
- To Crystal or Not to Crystal, Experimenters' Section, p. 52, April, 1929.

(Continued on page 78)

W4GV

WHEN the 1929 regulations went into effect they did not concern Mr. Cornelius W. Zimmerman, of 604 East Parker Street, Lakeland, Fla., the present owner and operator of W4GV, for W4GV, with its Type '10 tube, has come into being since then. The station and the operator were both initiated into amateur radio in February, 1929. In building W4GV, effectiveness, convenience, and low cost were three requisites. Although the station uses a simple self-excited circuit, the contacts which W4GV has had with stations in other countries and continents has amply proved that it is possible to fulfill these three requisites without maintaining an elaborate or expensive station.

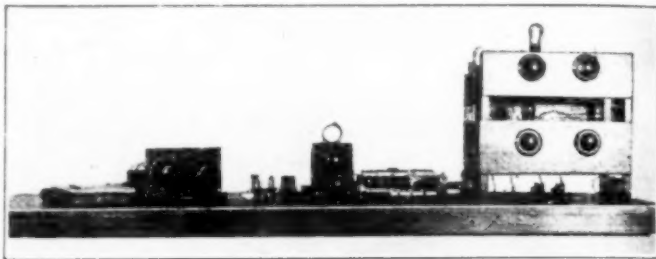
The station is built in a room in the basement, and is therefore quite comfortable in the summer when the weather gets hot. Moreover, by placing the station in the basement it was possible to obtain a suitable location for an antenna of almost any length suitable for amateur requirements. The cypress operating table is located directly in front of three windows. The two side windows are used for ventilation, while the center window was put to good use for providing insulation for the antenna feeders. On the table may be seen the receiver at the left, the monitor and station "chronometer" in the center under the call letters, and the transmitter at the right.

The first receiver to be used was a modest two-tube outfit using the circuit shown in Fig. 1. It was hoped that a screen-grid receiver could be built at a later date, but the original receiver using triodes was found to perform so well that it is still in use. The set is shown in one of the photographs. The wooden panel holds the tuning condenser (seen at the right), the regeneration condenser (at the left) and the band-spreading midget condenser between these condensers. The tuning condenser is a 100 μ fd. Cardwell remodeled so that only one rotor and one stator plate provide effective tuning capacity. The midget tuning condenser may be adjusted to permit the amateur bands to occupy a large portion of the tuning dial. This not only makes tuning in the crowded amateur bands easy, but makes it possible to tune a good distance on either side of the amateur bands.

The coils for the receiver are homemade and cover the 3.5-, 7- and 14-mc. amateur bands.

They are wound with bell wire on a cardboard tube two inches in diameter, and, when given a coat of celluloid and acetone solution, are removed from the tubing. The coils are then mounted on a UX-type of tube base that has been sawed off so that only the four metal prongs and the flat disc holding them remain. Bakelite strips are bolted to the center of the tube base and the coil placed between the two bakelite strips and bolted in place.

The detector tube may be seen at the left of



GENERAL VIEW OF W4GV

the coil and tuning condenser. The audio amplifying tube and transformer are seen to the left of the detector. Two small bakelite panels are

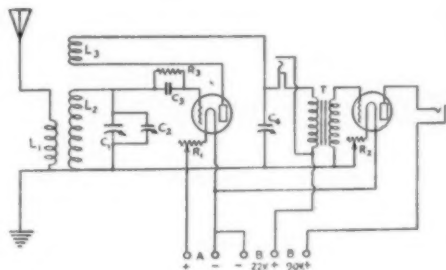
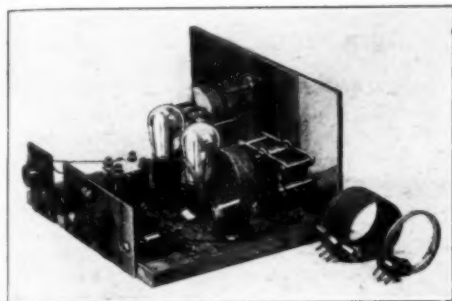


FIG. 1. — CIRCUIT OF W4GV'S RECEIVER

- L_1 — 4 turns, 2 inches in diameter.
- L_2 — 3 turns, 2 inches in diameter for 14 mc.
8 turns, 2 inches in diameter for 7 mc.
19 turns, 2 inches in diameter for 3.5 mc.
- L_3 — 4 turns, 2 inches in diameter for 14 mc.
5 turns, 2 inches in diameter for 7 mc.
9 turns, 2 inches in diameter for 3.5 mc.
- C_1 — Rebuilt 100- μ fd. tuning condenser, see text for details.
- C_2 — 9-plate midget receiving condenser.
- C_3 — 250 μ fd. regeneration control condenser.
- C_4 — 250- μ fd. regeneration control condenser.
- R_1 — 15-ohm rheostat.
- R_2 — 10-ohm rheostat.
- R_3 — 2-megohm grid leak.
- T — Audio frequency amplifying transform.

screwed to the back end of the baseboard. The right-hand panel holds the two filament rheo-

stats, filament switch and two 'phone jacks. The panel at the left holds a UX socket which is used as a part of the home made plug and cable



W4GV'S RECEIVER IS SIMPLE ENOUGH,
BUT IT WORKS WELL

arrangement to connect the batteries to the receiver; a UX tube base is used for the plug. The receiver is mounted on four soft rubber sponges

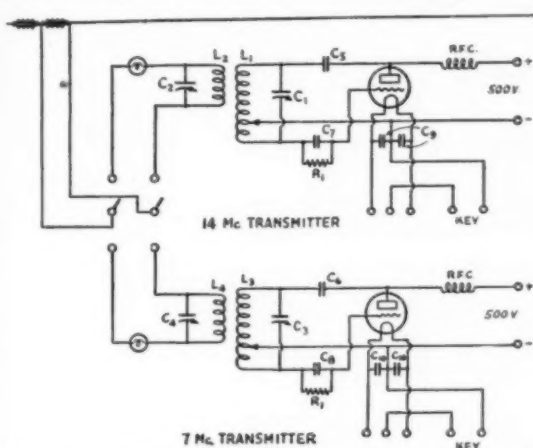


FIG. 2. — DIAGRAM OF THE TWO TRANSMITTERS AT W4GV

- L_1 — 3 turns, $\frac{1}{4}$ -inch copper tubing, $2\frac{1}{2}$ inches inside diameter.
- L_2 — 7 turns, $\frac{1}{4}$ -inch copper tubing, $2\frac{1}{2}$ inches inside diameter.
- L_3 — 6 turns, $\frac{1}{4}$ -inch copper tubing, $2\frac{1}{2}$ inches inside diameter.
- L_4 — 6 turns, $\frac{1}{4}$ -inch copper tubing, $2\frac{1}{2}$ inches inside diameter.
- C_1 — 500- μ fd. tuning condenser.
- C_2 — 250- μ fd. feeder tuning condenser.
- C_3 — 250- μ fd. tuning condenser.
- C_4 — 350- μ fd. feeder tuning condenser.
- C_5 — 500- μ fd. plate blocking condensers.
- C_6 — 2000- μ fd. plate blocking condenser.
- C_7 — 250- μ fd. grid condenser.
- C_8 — 2000- μ fd. grid condenser.
- C_9 — 2000- μ fd. filament by-pass condensers.
- C_{10} — 1000- μ fd. filament by-pass condenser.
- R_1 — 11,000-ohm tapped grid leak.
- RFC — 160 turns No. 30 D.C.C. wire on $\frac{1}{4}$ -inch dowel rod.

which keep it quiet when the operating table is jarred.

W4GV'S TRANSMITTERS

During the first five months of operation one transmitter was used for operating in both the

14- and 7-mc. bands. Difficulty was found in returning to the same frequency, and considerable time was lost in retuning the transmitter each time it was operated in a different band. More thought resulted in the construction of a second transmitter. Both transmitters use the Hartley circuit, as shown in Fig. 2, and are of high-C design.

The construction of the transmitters may be seen from one of the photographs. Panel and sub-panel method of construction is used for both transmitters, and the transmitters are mounted one above the other. The first or bottom transmitter is four inches above the table; the second is ten inches higher. Filament voltmeter and plate milliammeter for both transmitters are mounted on the end of the framework in full view of the operator. Immediately above these meters are two porcelain switches for changing the filament and plate power supply from one transmitter to the other.

On a wooden panel in the rear of the frame

are mounted two rows of Fahnestock clips and a double-pole double-throw porcelain base switch. The double-pole switch is the antenna change-over switch to connect either transmitter to the radiating system. The two sets of Fahnestock clips are connected to the jaws of the filament and plate supply switches at the end of the transmitter. The blades of these switches are connected to the four Fahnestock clips on the wooden cross-piece at the bottom and rear of the transmitter frame. Each transmitter can be removed from the framework by disconnecting the six antenna and power leads and sliding the transmitter forward toward the operator.

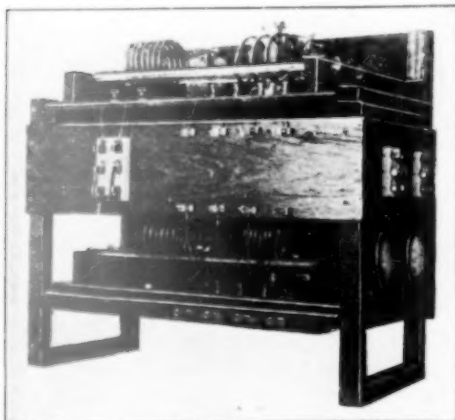
The lower transmitter operates in the 7-mc. band. The tuning condenser consists of a 250- μ fd. variable condenser shunted by two 500- μ fd. fixed condensers connected in series, so that the tuning capacity varies from 250 μ fd. to 500 μ fd. The feeders are tuned with a 350 μ fd. variable condenser. Since funds were not available for the purchase of a radio-frequency ammeter, a flashlight bulb is used to indicate resonance. A miniature socket is mounted in the antenna lead and a six-volt lamp, shunted with a length of No. 12 wire, serves very well as an antenna resonance indicator. The transmitter may be tuned easily by watching the indications of the antenna lamp and the plate current meter.

The second transmitter is constructed much the same as the first although, of course, some changes were necessary, as this transmitter operates in the 14-mc. band. The tank circuit

of this transmitter is tuned with a 500- μ fd. condenser; a 250- μ fd. condenser is used in the feeder system. Tapped resistors are used for grid leaks in both transmitters, and this is found to be a decided convenience in adjusting the transmitter. Both transmitters are built after the design of the Hartley transmitter described in the August, 1928 issue of *QST*.

POWER SUPPLY

A center-tapped 250-watt transformer, having voltages of 500, 750 and 1000, supplies power to the plate of the oscillator tubes. A 40-jar chemical rectifier is used with lead and aluminum electrodes one inch wide and three inches long. A thin layer of oil is used on top of the solution of borax and distilled water to prevent excess evaporation of the electrolyte. The rectifier has been found to be entirely satisfactory in operation and requires very little attention. The filter consists of a "dime store" 30-henry choke coil and a 1- μ fd. condenser "fore and aft" of the



A BACK VIEW OF THE DOUBLE-DECKED TRANSMITTER

choke. Reports that the signals are r.a.c. are obtained with the filter out but these reports change to d.c. with the filter in the circuit.

An 8-volt center-tapped filament transformer is used for the filament supply. The filament voltage is adjusted by a wirewound rheostat in the primary of the filament transformer. The transmitters are keyed in the center tap of the filament circuit.

The monitor at W4GV is not only used to check the performance of the transmitters but is used also as a frequency meter. It is built in a completely shielded Radiola III cabinet; although the box is somewhat small, it is possible by using small filament and plate batteries to place all the necessary components in one box. All apparatus is mounted on the panel so that, if necessary, the monitor may be easily removed

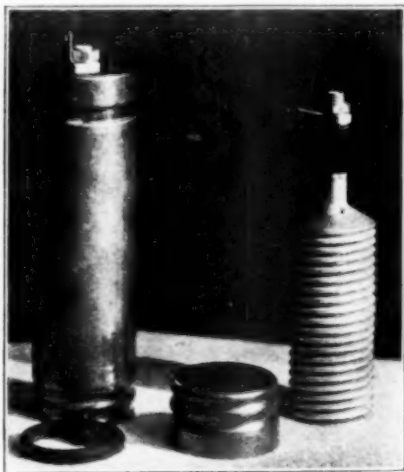
from the cabinet. Only a 7-mc. coil is provided; for 14-mc. operation, the second harmonic of the monitor is used.

A Zeppelin antenna having its fundamental in the 7-mc. band is used for 7- and 14-mc. operation. One end of the antenna is supported by a 45-foot cypress pole in an orange grove and the other end is fastened to a pole on top of the house. Feeders are spaced with glass rods purchased from the local five- and ten-cent store. Both the antenna and feeders are made of No. 12 enameled copper wire.

The equipment at W4GV is completely home constructed. The station is neither an elaborate nor an expensive one, yet it is entirely complete. The results that have been obtained have been very gratifying. W4GV is a good example of what can be done with limited equipment.

A New Electrolytic Condenser

AN improved type of electrolytic condenser which has several advantages over the older form has been developed by the Sprague Specialties Co. of Quincy, Mass. The voltage rating of the new condenser is higher than



could previously be used, while at the same time the leakage current and series resistance faults have been considerably reduced.

An exploded view of the unit is shown in the photograph. The anode (at the right) is a corrugated aluminum cylinder, giving a large effective surface area. The edges of the corrugations are rounded off to reduce leakage. This feature makes this type of construction superior to that using a ribbon anode, as the leakage is greatest when the edges are sharp. There is no way of electrolyte escaping from the cell. The cathode is a cylindrical

(Continued on page 80)

I.A.R.U. NEWS

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Norwegian Radio Relay League

Radio Society of Great Britain

Reseau Belge

Reseau Emetteurs Francais

South African Radio Relay League

Wireless Institute of Australia

Conducted by A. L. Budlong

WE hoped to have several new societies added to our official roster at the head of this column this month, but return votes from the various member-societies are slow in coming in, and we are not yet able to announce any results from the December, 1929, calendar. It was this calendar in which the new societies were proposed for membership.

Member societies which have business to present to the Union, or non-members who wish to affiliate with the Union, are urged to communicate with Union Headquarters immediately, in order that any matters of sufficient importance may be included in the next semi-annual calendar, to be sent out in June. We already have one additional society for proposed membership. The *Rede dos Emissores Portugueses* has signified its intention of wishing to become affiliated with the Union, and will be presented for a vote in the June calendar. Amateurs who are familiar with the good work of this Society in Portugal, and of the activity of Portuguese amateurs in amateur matters, will be glad to learn of this move.

Interest in the WAC Club continues high, and certificates are being issued at a greater rate than ever before. We have now started receiving applications from hams who have worked WAC on 'phone, and

one such certificate has been duly issued to the President of the Reseau Belge, Mr. Paul de Neck. FB OM!

Interest in the DX Tables seems to be falling off. No tables suitable for including in this month's department were received. We want to add, however, that Mr. Al Giddis, W1ABG, has sent a very excellent table for the months of June, July and August, and this will be printed next month, with, probably, the last of the tables of Mr. Ponting, G6ZR. Thereafter, unless re-



AMATEURS ATTENDING A GENERAL MEETING OF THE RESEAU BELGE RECENTLY

Many French amateurs made a special trip to attend this meeting. The two gentlemen on the bench in foreground are Mr. Robt. Larcher (left) and Mr. Paul de Neck. No, we do not have the names of the YLs!

newed interest warrants it, the feature will be discontinued.

Which reminds us to state that we are more than willing to include in this section of *QST* anything that pertains to international work and that the readers want. So if you have something you want to see here, let us know about it, and we'll try to oblige. That, you will remember, is how the DX Table business started, and while it now appears to have just about fulfilled its maximum usefulness, it met with considerable favorable reaction for many months. So fire away.

WAC awards for 1928 appear at the end of this month's column.

BELGIAN SECTION

By Paul de Neck, Pres., Réseau Belge

An International Congress of short-wave transmitters is going to be held in Antwerp and Liege next July, on the occasion of the International Exhibition celebrating the Centenary of Belgian independence. The executive committees for the two sections have been designated as follows:

For Antwerp: Messrs. Keerse, ON4GW (President); Verhelst (Vice-President); Respen, ON4HV (General Secretary); Quaeysaegens (Secretary); Leebuyckx (Treasurer); Dierickx, ON4EA and Nissen, ON4GK (Technical Advisers); and Perleaux, ON4IA and Dierckxens, ON4CZ (Traffic Managers).

For Liege: Messrs. Pissart, ON4PJ (President); Dabempre, ON4FH (Secretary); and Jonlet, ON4JJ (Treasurer).

The Congress shall be opened in Antwerp the 12th of July, 1930, and the program will be as follows:

Antwerp Section: Saturday, July 12th: Opening reception by the President of the Réseau Belge and officers. Visit to the Antwerp Exposition. Sunday, July 13th: International meeting with special program; visit to the Antwerp zoological gardens; special transmitter and receiver tests at our booth; special folklore attractions and entertainment. Monday, July 14th: International meeting; conclusions; special trip on the River Escaut and visit to the new maritime installations; banquet and hamfest at the exposition.

Liege Section: Tuesday, July 15th: Reception by the Liege section; visit to the international exhibition; technical meeting with special program; banquet and hamfest with special entertainment. Wednesday, July 16th: Technical meeting; conclusions.

Brussels Section: Thursday, July 17th: Reception by the Brussels section; visit through the city and principal wireless stations in the vicinity; banquet and hamfest; close of the Congress.

On the following day, at Brussels, will take place a special historical pageant, depicting all

the costumes, emblems and banners from the time of the Romans up to the present.

Brother hams from all parts of the world are cordially invited to take this opportunity to visit Belgium, and special arrangements are being made to give men a cordial and friendly welcome. Those desiring further particulars may secure them by writing to the Secretary, Réseau Belge, 53 Boulevard Anspach, Brussels, or to the Antwerp Section, 15 Plaine de Malines, Antwerp.

General conditions on both the 7000- and 14,000-kc. bands have been rather poor for DX work, and nothing of particular interest is known at the moment. ON4HC has been in good contact with CETAA, at Punta Arenas; ON4XAN worked XTF90, on 48 meters, this being a ship near Spitzbergen; ON4GW and ON4KIR were received RS on 'phone by IIMM in Italy.

BRITISH NOTES

By J. Clarricoats, G6CL, Hon. Sec'y, R.S.G.B. and B.E.R.U.

Additional interest in 28-mc. work has recently been noted, as a direct result of the special R.S.G.B. tests arranged by our Contact Bureau Section. During February conditions were somewhat variable over the week-ends. An increase in first contacts was reported. G5VB worked FMSRIT, and G6HP worked SUSRS, both being notable contributions. YIILM was heard at good strength in London on February 23d, while ZS4M seems the most reliable South African. Very few new W stations have been logged.

Successful two-way working was established on 56 mc. between G2OL and G2OW. This is probably the first authentic QSO made in England by amateurs working in this band.

On the 7- and 14-mc. bands conditions showed a definite improvement. During the A.R.R.L. tests considerable activity was noted, although during the early days of the tests contacts from London appeared to be difficult except in the case of high-power stations.

Attention has been drawn to the fact that the conditions reports which appear in these notes are not always a true representation of the state existing at the time, but I would mention that in general an attempt is made to present average conditions for the month based on evening work, mainly, as the majority of the world's amateurs are busy during the day.

A series of 1750-kc. tests are to be run during April by the Contact Bureau Section. European amateurs are cordially invited to take part in this attempt to prove the present-day utility of this band. To clear up any misconception which may have arisen regarding the B.E.R.U., we would state definitely that the British Empire Radio Union is the name given to our Colonial membership, and is not intended in any way to

(Continued on page 64)

Calls Heard



A. H. Tilse, Railway Parade, Yeronga, Brisbane, Queensland

w7ag w6xw w6ev w6ad w6ps w6chk w6eph w6gm w6btz
w6ent w6emd w6um w6dr w6ax w6apm w6ghv w6bcp
w6eft w6bau w6ban w6mb s8eg w6enl w6adm w6eau
w6bat w6ak w6ahx w6uf w6jv w6ko w6ly w6aef w6bk
w6am w6wo w6awl w6amt w6ce w6dp w6as w6dp w6ps
w6pw w6hr w6bi w6bux w6cpr w6ags w6api kalcx kalcl
kaljk kaljr kalac kalbe kalpw kaldj kalhr kalac kalnj
kalac kalcm kldp klhr klce k4ko lutaj oas4 oatr oadm
oast oaeq oasb oas4 vs3ab vs6ae vs6ah vs7ag vs7ap
vs2bq vs2sq cu2dn f8bu v8et f8wb f8ho on4tb on4bz
on4pj on4my pa0gw pa0dw pa0hb g2dz hc2jm hc2ah
helfg su8rs apal sp3lb zu2uu ac8hm ac6bd ac2ag pylaw
pylca py2al pk2ag pk5bm pk4bo lu2g xla xla j2cb ju2de
zo7ax et1bg cm2ae

SM6WL, Gothenburg, Sweden

14,000-ke. band

wlagi wlasf wlibl wlbwa wlcaw wlcow wlcrc wlma
wlrv wlse w2aev w2ahi w2alk w2arb w2exl w3hq w3ajd
w3dh w4aef w4adm w8ea k4kd vk2ns vk5gr vs7ap vu2x
zs2n zu6w

7000-ke. band

wibwl w2alu w2exl w4aef w4ft w8gz hclfg kalre kfzt

28,000-ke. band

fm8bg fm8rit fm8bg

G5GP, Gus Parslow, 27 Eastbourne Road, Tooting Junction, S. W. 17, England

14,000-ke. band

aeleb ce5aa ce7aa cxloa fo3sl fofsr pylah pylca pylcm
py2ad py2ak py2ba ve2aa ve2be ve6ao ve6aw vk2kj
vk3go vk5gh vk6mu vo8ae vo8mc su8ryv vq2bs vq2nc
vq4msb vq5bh vs7ap vu2dr yl2gy zl2gh zl3aj zsm zsm
zs5w zt5r zu6w wlaqt wlasf wlcw wlda w2abi w2ba
w2bka w2nm w3ajd w3bhp w4ahl w8ak w8dm w8et wfa

W6DZM, George De La Matyr, 119 East Raymond St., Compton, Calif.

7000 and 14,000-ke. bands

ae1bd ae1bx ae8ew ae8go ac8hm ae8rv ae8tj ae8wp au1zy
ce3ag ce3dg ce5aa cm2xa cm8yb ct3aj deaav ear152
fdm f8an fm8rit g5by g6wy hclfg hc2jm ill jldm j3et
jldp k8an k4dk k6alm k6bhl k6cu k6cxo k6eqm k6ew
k7anq k7ew kalaf kalag kalau kalce kalcy kalcl kalhe
kalhr kaljr kalme kalpw kalre kalac kdv5 laiw lu3fa
lu3pa nj2pa nn1nic nn7nie oa4q ok2ai ozlk oz7y py2ih
py2ii py2yb sm4xx sm5tn sm7rv ve2be ve2ax ve2ay
ve3bm ve3bq ve3ej ve3ez ve3kd ve3fe ve3gt ve3kp ve4be
ve4bu ve4cu vedu ve4fd ve4gk ve4gq ve4hd ve5ev ve2dy
vek2es vk2hm vk2lf vk2lv vk2nb vk2ns vk2rb vk3ag
vk3bw vk3es vk3go vk3hk vk3hl vk3ho vk3nj vk3pr
vk3rg vk3tm ve3wv vk3wx vk4bh vk4gk vk4kh vk4mm
vk5gh vk5it vk5mb vk5wr vk6sa vk6wi vk7eh vk7dx
vs3ab vs5aa vs6ag vs7ap v6eqq wfa wfat x2a x2at x2x
s5a x9a xen8mbj zliaa zliaa zlibb zlibe zlibi zlibf zlibf
zlibf zlibf zliaa zliaa zliaa zliaa zliaa zliaa zliaa
zlibb zlibc zlibc zlibc zliaa zliaa zliaa zliaa zliaa

VK2JT, C. Luckman, 72 Wangee Road, Lakemba, N. S. W., Australia

w1tk w1bkf w1ajj w1co w2ma w2exl w2wy w2asg w2aaw
w2eb w2ra w3anh w3en w3ant w3evj w3rm w3au w3to
w3js w4ao w5amn w5aan w5aqy w4axb w5wg w5aa w6awp
w6aut w6am w6amn w6amn w6aih w6abg w6amm w6btd
w6bh w6bh w6ch w6bpo w6dvz w6dlo w6dmn w6dpl
w6de w6ebg w6els w6eh w6ee w6eia w6emt w6ek w6eqf
w6eoz w6ebn w6ihj w6of w6rpf w6wak w7aag wabg w7acg
w7aco w8amg wart w7aiz w7ajw w7acg w7acd w7amg
w7art w7aiz w7ajw w7aj w7be w7dow w7mb w7ts w7wg
w8bud w8eyp w8fa w8rl w9an w9ubh w9bqe w9dfy w9ecz
w9eke w9eve w9um kalme kalpw kalac kalce kaljr kalcm
kalre kalhe kalhr kalcl kalcy kalxa kalpr k6ch k6est
k6ewb k6ewc k6or kalpr k6eh k6est k6ewb k6or k6eum
k6euw k6esb k6evw ac2ff ac3fr ac8rv ac8ew ac1bx ac1ts
ac8zw ac8go ac1cd ac2ay ve5js sp3kv lu3oh pylab py2ik
omitb sdaz rl1lf cx9r wfa bam xwh xlem

K4KD, E. W. Mayer, Box 103, Ensenada, P. R.

7000-ke. band

wladw wlae w1ajd w1bl w1ld w1mk w1pk w1vf w1wr
w1za w2afu w2afp w2alo w2aof w2aoj w2ass w2box w2bpe
w2cbp w2cmu w2eqd w2de w2fn w2rd w2uk w3aer w3arp
w3att w3avm w3bel w3dg w3ia w3ke w3na w3ux w4agr
w4akw w4ar w4em w4fx w4gz w4ik w4si w4we w5afi w5afn
w5ef w5mi w5qj w6bfe w6btx w6bxi w6czk w6dpl w6ieb
w6eif w6equ w6lx w6sf w7ac w7amx w7be w8aat w8aks
w8ayw w8bax w8bex w8bdk w8brh w8cm w8eyg w8dgb
w8ddl w8hx w8im w8la w8np w8pp w8sg w8yb w9aay
w9apd w9aqz w9bvh

14,000-ke. band

w1axw w1bjn w1bl w1wv w2arb w2atk w2bbv w2bex w2bih
w2biv w2bka w2bon w2bwe w2evj w2fn w3apn w3cj w3gf
w3ma w3rg w4pk w4abe w4bet w4bto w4cfr w4dxv w9ams
w9elh w9ffq g2ma g5rq ve2be ve3da vk2gs xox

7000-ke. band

w1anx w1bl w1cd w1cft w1mk w1np w1sz w2are w2ate
w2auy w2avo w2ayj w2bai w2bvl w2bzb w2cg w2fn w2kj
w2nt w2rd w2rt w2uk w3aer w3ahs w3amp w3apf w3apf
w3ato w3jf w3hs w3lu w3uh w3vb w4aef w4agr w4ajk
w4al w4ft w4lx w4oc w4qn w4we w5blv w5cf w6aaz w6abg
w6beb w6byh w6bad w6cum w6cwx w6czk w6dpl w6dwi
w6ehi w6epz w6ew w6kg w6yx w7ac w7be w7kr w7mo
w8aat w8acb w8adg w8aed w8aks w8aqm w9ac w8bce
w8bgx w8bid w8bcp w8bnt w8bpf w8byn w8cau w8cbi
w8cwf w8eyg w8eyj w8dap w8dlg w8dme w8dub w8dyk
w8gz w8hx w8js w8np w8sk w8yb w9aay w9azy w9bba
w9bko w9bqe w9bwj w9ebk w9ecs w9eps w9cuu w9dck
w9ebo w9egq w9elx w9eru w9fdl w9fmr w9fsx w9gdh w9gdm
w9ggq w9um w9yc kfr6 ve2ca ve3da ve3fn ve3gf ve3go
wlabg wlabl wlaag wladj wlap2 wlasf wlafe wlabd
wlibt wlibr wlibb wlibk wlibx wliby wlibf wlibd
wlibv wila wilm wily wlvz w1zb w2aay w2ajj w2amm
w2aog w2arb w2bbv w2bok w2bys w2cex w2cuq w2cd
w2fp w2kx w2ma w2ns w3acx w3adp w3aiu w3aiz w3ajh
w3ake w3arx w3atj w3ekl w3dh w3fb w4abr w4abj w4ly
w4pj w5ww w8axa w8bm w8bx w8bup w8cew w8era
w8ded w8djv w8dpq w8dxv w8nw w8of w8pr w8ul w8ay
w9aja w9bdw w9ef w9dga w9dxl w9ef w9exw nj2pa ve2ac
ve3bk vk2ns vk2rx x9a

(Continued on page 84)

Correspondence

The Publishers of QST assume no responsibility for statements made herein by correspondents.



The Army-Amateur Radio System

Independence, Calif.

Editor, QST:

A question often asked me these days is, "Why should I join the Army-Amateur Net? Is there anything in it for the ordinary amateur?" Having applied and been accepted by the A.A.R.S., I can quote some real advantages I have received.

The first point is that I now have an established, reliable traffic outlet, giving me an opportunity to report to the SCM with something more than "Traffic very light this month." The second is that I have a better excuse for operating a station than the usual "Ur sigs RAC FB," etc. The third, and from my personal standpoint, the most important, reason is that it gives excellent practice in copying transmissions not in plain English, my job being to handle a wire for the Western Union Telegraph Company.

The A.A.R.S. nets often shoot out unpronounceable cryptograms — "hash" as it is sometimes called — and it is necessary to hold an A.A.R.S. ticket to decode these transmissions or know when they are actually in code. Furthermore, the facilities are at hand to check your errors. After copying a few such "QYXTJLS-VEZ" I land in my WU office next morning, and when some messages come in in Spanish or industrial codes I assure you they become easy in comparison. The technicalities have vanished, unfamiliar words have lost all terror, and if that does not make a better operator, whether land line or radio, I am shy considerable code work in my 22 years of telegraphing.

I hope new hams and others will learn the real value of Army-Amateur work.

—Merle Smith, W6EAF, Alt. NCS, 9th Corps Area

From the I.A.R.A. of China

Shanghai, China

Editor, QST:

Herewith enclosing list of calls heard by Station ACSHM operated by Mr. H. MacGowan, of Shanghai.

We trust that this information will be of interest and worthy of attention in that wonderful organ, QST. We want you folks on the other side to know that through the means of amateur radio, we are enabled to keep in touch with one another regardless of the miles that may separate

us, and also that your interests are our interests and that we look to the American Radio Relay League as a son does to his father.

Wishing the American Radio Relay League every success.

— T. J. Engstrom, Secretary,
The International Amateur Radio Association of
China

XDA

Buffalo, N. Y.

Editor, QST:

I would like to register a protest against commercial station XDA.

He is not only within the 14,000-kc. amateur band, but his signals spread over five degrees on my tuning dial and his key clicks much farther. Can nothing be done about this encroachment in our band?

—Burton T. Simpson, M.D., W8CPC

EDITOR'S NOTE: Mexico has not ratified the Washington Convention of 1927, and is therefore not bound to observe the frequency assignments for different services outlined in that treaty. It is our practice in cases of this kind, where the country in which the interfering station is located is a party to the Convention, to refer the question to the I.A.R.U. section in that country for action. There is no national society in Mexico affiliated with the I.A.R.U.

Good News Two Ways

Ancon, C. Z.

Editor, QST:

I wish you would publish my gratitude toward Sgts. Henry C. Grant, 10th Signal Co., Corozal, C. Z., and George C. McVicker, 15th Signal Co., Ft. Monmouth, N. J., stations KDV5 and W2CXL respectively, for their prompt aid in obtaining the good news for me, in about 40 working minutes, that my father had recovered from pneumonia, and was again up and about at his home in Long Island, N. Y. I was very much worried down here in the Canal Zone, for I naturally feared that the worst was to come.

I promise in future not to censure my husband when he stays late at KDV5 with his ham friend, Sergeant Grant.

Continued prosperity to the A.R.R.L. and the Army and Navy Ops.

—Mrs. A. A. Kopf

RESISTOR Announcement!

A new wire-wound precision resistor for uses where accuracy and low temperature co-efficient of resistance are required . . . the first resistance that successfully meets these important demands. Tested and guaranteed.

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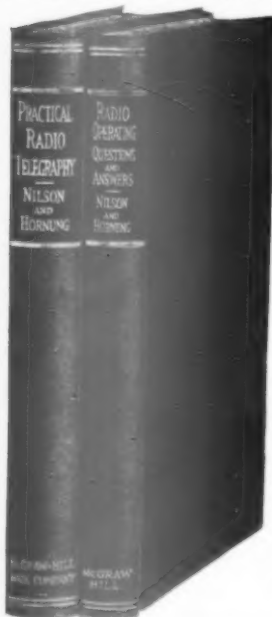
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and J. L. HORNUNG, Fellow Radio Club of America; Associate Member I.R.E.

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Name.....
Home Address.....
City and State.....
Name of Company.....
Occupation..... QST 5-30

Broadcasts from W1MK

Editor, QST:

Ever since the Spokane flight started, I have been trying to get a solid copy of broadcasts from W1MK, but have failed on account of the dozen or so stations that continue to operate on W1MK's frequency. Have been following your endeavors to collect the different news items from the several amateurs who are in touch with the patrol, so that you might give us to all available reports up to 10:00 p.m. every night. Have noticed the poor cooperation of amateurs in something that I deem very interesting, and which ought to be the same to every amateur, as it brings us closer to the Signal Corps.

It seems to me that out of common courtesy to W1MK and the other 17,000 amateurs that all stations should keep clear of a channel sufficiently wide to allow W1MK to reach everyone without interference. We all ought to be interested in every signal that W1MK puts on the air, and tune him in whenever he has something to say. Personally, I have never heard W1MK on the air when there was not something being broadcast that concerned us all. I had rather copy W1MK than work my own little set.

I am certain that there are many more amateurs who would be pleased to see a channel kept clear for the use of our Headquarters station.

Let's hope this comes to pass in the near future.

— Ross W. Brown

A Good Method of Calling

Pettit Barracks, Zamboanga, P. I.

Editor, QST:

Would it be possible to insert a note in QST to the effect that amateurs in the States who wish to work DX should be more careful in giving their call letters? Quite often the signals are faint, and, while making CQ very slowly and distinctly, the call will be sent about 30 per minute. The result is that it is a jumble, and you pass up that station for one who makes his call letters slowly and distinctly. Only this morning I heard one signing W2C??, who, I am sure, would be pleased to know that his signals were being heard half way around the world. However, he made his call letters so fast and ran them together to such an extent that it was impossible to read him.

In this regard, I believe the system used by VK5HG the best I have heard. He usually calls as follows: CQ CQ CQ de VK5HG VK5HG VK5HG, repeating this over and over. The result is that you know exactly when he is going to give his call letters, and can be on the alert in case you missed him previously.

The point of the entire matter is that we are more interested in getting the call letters than we are in hearing CQ over and over. Less CQ and more call letters distinctly sent.

— W. N. Haltiwanger, 1st Lieut., 45th Inf.

New Screen Grid Neutrodyne Power Speaker Radio

*In the Popular Newly Designed
Low Utility Consoles!*

Look at the pictures of the new Crosley "Companionship" Series shown in this advertisement — read the descriptions of chassis and cabinets, note the low prices — then determine for yourself whether or not they represent the most amazing radio values ever offered. These "Companionship" Series models, with their unusual features and unexcelled performance, will readily become true companions in millions of homes!



The CHUM

This model is a useful inconspicuous, low 3 and 5-ply walnut veneer cabinet for use anywhere. An improved Dynacore moving armature electro-magnetic power speaker is concealed in the cabinet. Uses six tubes — two Screen Grid No. —24, one

No. —27 as a bias-type power detector feeding into two No. —71-As connected push-pull, and a No. —80 rectifier tube. Has built-in power supply incorporating genuine trouble-free Mershon condenser. Dimensions: 28 1/2" high x 27" long x 14 1/2" deep. Amazingly low priced at only...

\$75

Less Tubes

The PLAYMATE

This beautiful wood model is built of two-ply walnut veneer. The set incorporates the semi-tube refined Crosley Monotrad chassis. Uses two Screen Grid



tubes No. —24, one No. —27 as a bias-type power detector, one No. —27 as a resistance coupled radio, two No. —45 tubes in push-pull, and a No. —80. The latest refined Crosley type "M" Dynacore power speaker is concealed in the cabinet. Dimensions: 29 1/2" high x 28 1/2" long x 16 1/2" deep. No radio value ever approached this model at only...

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Less Tubes



The COMRADE

This set is enclosed in the same cabinet as the "Playmate" but incorporates the refined Crosley Unitrad eight-tube chassis, giving somewhat greater sensitivity and performance due to the use of

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Less Tubes

With the presentation of the new Crosley "Companionship" Series there is ushered in a new era in the development of radio receiving sets for the home. It is now possible to obtain radio sets — complete in beautiful low console utility models — with improved power speakers built in — using Screen Grid tubes, with Neutrodyne circuits, operating from electric light sockets — at prices so low that everyone can afford to own one. Get in touch with your Crosley distributor today — get your share of the profitable business being created by this amazing new Crosley "Companionship" Series.



The BUDDY

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This handsome "Buddy" model has a metal case with panels in beautiful burl walnut finish. The trim is silver and ebony inlay effect. The legs as shown are standard equipment. An improved Crosley Dynacore power speaker is included at the price, and is installed under the cabinet. Uses six tubes — two screen Grid No. —24, one No. —27 as a bias-type power detector feeding into two No. —71-As connected push-pull, and a No. —80 rectifier tube. Has built-in power supply unit incorporating genuine trouble-free Mershon condenser.

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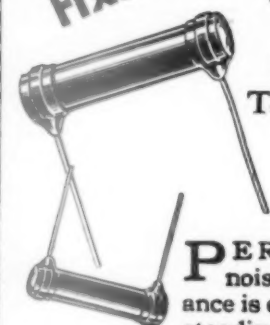
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Auroral Display

Fairmont, Minn.

Editor, *QST*:

Having read the article in December *QST* on auroral interference, I would like to report an auroral display I observed, which seems to be at odds with all I have ever seen published. It took place in southern Minnesota during warm weather in 1917 in the early evening — before 10 p.m.

It first appeared as a glow (pink tinge) in the northwest with rapidly growing intensity, and appeared as a characteristic curtain aurora; like a drape sharply defined at the top, with a rather indistinct lower edge that wavered about. This rapidly approached us, from the northwest, and at the same time descended and also fluttered more violently as though blown by a wind. Then it began to break up into sections, and these, still coming closer, broke up into patches of light. These patches of light were quite distinctly outlined and looked like small clouds of phosphorescent fog. They were absolutely parts of the auroral display, yet they came down, still giving light, until they rubbed out against the ground.

Several of them passed between us and groves of trees so that I could swear that they were less than one fourth of a mile away. There was a very light breeze from the northwest, but these pieces of aurora do not seem to have depended on the wind for they traveled much faster. We tried to run into one of them with a car, but they traveled much faster than we could go — we could do 60 miles per hour easily, but they seemed to travel about three times as fast as we did.

This would seem to discount the belief that the aurora is a phenomena of rarified air, or that it only takes place in the upper regions of the atmosphere.

I have never seen another one break up and come drifting down in pieces and they are not common in this locality, and I have often wondered if any other people have seen such a display.

If several observers could be found to report such low auroral displays and have seen them actually rub out on the ground, would it not upset all present theories of aurora?

Perhaps some of our Canadian or Alaskan hams, or those with extreme northern United States locations, could report similar experiences if they would. I realize that one report won't change the accepted ideas of where the aurora takes place, but several would at least start an investigation.

— J. A. Nightingale

We Do Progress

Abilene, Texas.

Editor, *QST*:

It has been some time since I have had the pleasure of exploring the pages of *QST*. Today while going through the March issue I noted the article on 14-mc. 'phone transmission. I would like to take this moment to compliment *QST* on

Radiotron

UX-864

A General Purpose, Non-microphonic Tube

Possessing superior rigidity of construction, UX-864 may be used to advantage by amateurs in the design of their receivers and their microphone amplifiers.

Its freedom from microphonic noises, even when subjected to continuous vibration; its economy of operation, its small over-all dimensions—all these are features which will establish UX-864 as an important contribution to the improvement of amateur reception and transmission.

Sensitive in performance, yet free from microphonic disturbances,



Filament volts	.	.	.	1.1
Filament amperes	.	.	.	0.25
Plate volts	.	.	.	90
Grid bias volts	.	.	.	-4.5
Plate current (m.a.)	.	.	.	2.5
Plate resistance (ohms)	.	.	.	15,500
Amplification factor	.	.	.	6.6
Maximum length	.	.	.	4"
Maximum diameter	.	.	.	1 3/16"

Radiotron UX-864 will be appreciated by those amateurs who desire improved tube performance.

RCA VICTOR COMPANY, INC.

New York—261 Fifth Avenue

Atlanta—101 Marietta Street

Chicago—100 West Monroe Street

Dallas—Santa Fe Building

San Francisco—235 Montgomery Street

THERMO-COUPLE TYPE METERS

Model
425

Made as Thermo - Ammeters, Thermo - Milliammeters, Thermo - Galvanometers.



for Panel Mounting

A new incentive to experimenters, and particularly radio amateurs, is found in the paramount development of the year—the pentode tube. Among the many suggested applications is that of the amateur transmitter with a single tube. Its possibilities are interesting and it is predicted that many new circuits will result from this development.

How about your electrical measuring equipment? Are you in need of suitable instruments for this work? They should be of highest quality and the most approved scientific design—precise, dependable and yet reasonably priced.

The Weston Thermo-Couple type instruments are especially suited to transmission requirements. The Ammeter, in ranges from one to twenty amperes, has a safe overload capacity of 50%. You can rely upon its accuracy for such purposes as measuring high frequency currents imparted to the antennae. The Milliammeters, furnished in three sizes—125, 250 and 500 ma., are ideal for short wave transmission as they have a very low internal electrostatic capacity, give true current value and do not disturb the constants in a transmitter.

Accuracy unaffected by hours of constant service. No fear of burn-outs, even under heavy overloads.

Weston Electrical Instrument Corp.
602 Frelinghuysen Avenue, Newark, New Jersey



this article, as I consider it one of the most comprehensive articles that I have ever read!

My work deals entirely with 'phone transmission, and it was indeed a pleasure to see amateur 'phones taken in the same light as broadcast transmitters.

The days of absorption loop modulation are over, and it seems good to me to see the interest that is being shown in honest-to-gosh amateur 'phones.

It has been two years since I have listened in on frequencies above 1500-kc., and received the surprise of my life when I unlimbered the old regenerative set last night and noted the difference on the higher frequencies. Almost all the old familiar signals that I knew were gone, but they were replaced with fine clean-cut signals that would be a credit to many a commercial station.

I hope the amateur fraternity keeps up the good work; it is wonderful as is. I'm for you and hope that I can be back in your ranks again soon. More power to you.

— Wm. N. Greer, Chief Engineer, KFY0

I.A.R.U. News

(Continued from page 58)

take the place of or compete with the I.A.R.U. The latter is an international body representing the national amateur societies of the world, while B.E.R.U. is but a suitable name for describing R.S.G.B. members located elsewhere in the British Empire.

We are pleased to record that our B.E.R.U. membership has almost reached the 200 mark. Egypt has recently provided us with a number of new members, while Canada, South Africa and Australasia continue to swell the Union. Our ultimate aim is to extend the B.E.R.U. into every corner of the British Empire. All inquiries should be directed to the Headquarters, 52 Victoria Street, London, S.W. 1.

GERMAN SECTION

By W. Rach, D4ADF, Sec'y, D.A.S.D.

Considerably more activity has been shown by German hams on 3.5 mc., particularly by D4KZA, D4ADF and D4AFA. D4ABV and D4ABF, of Breslau and Karlsruhe/Baden, respectively, are working in that band, too. The principal reason for this 3.5-mc. activity seems to be the terrific QRM experienced on 7 mc. Over here, it must be remembered, we have many 'phone stations "busy" on 40 meters. It is everyone's sincere hope that they will leave the already crowded 7-mc. territory, however, and go either to 3.5 mc. or up to 1.75 mc.

When the QRM permitted, DX on 7 mc. was fair, and quite a few W stations were heard. Only a few of the D's got hold of them, though.

On 14 mc. some D's carried out tests with South Africa; D4LD being one of the leaders in this work. The most favourable time for South

The Communications Department

F. E. Handy, Communications Manager
E. L. Battey, Asst. to Coms. Mgr.
1711 Park St., Hartford, Conn.



Notes on Frequency Observance

There are monitors for listening and adjusting purposes, and monitors for FREQUENCY CHECKING PURPOSES, BUILD ONE OF EACH.

A simple, rugged, but inexpensive oscillator, set apart from other station equipment, constitutes a heterodyne frequency meter when accurately calibrated. As to details, you may provide it with a trimmer condenser with a clamp to "set" the adjustment each time it has been checked with a reliable "marker" standard and equip it with a vernier type dial for accurate reading purposes. USED ALWAYS before going on the air by EACH AND EVERY amateur station owner, we believe this is the solution of this off-frequency problem. At least one manufacturer builds variable condensers with air dielectric and circular plates to give a moderately high-fixed minimum capacity. Such tuning condensers or other suitable methods may be used for band spreading and also to minimize undesirable effects of variable tube capacities. Ordinary 100-mmf. fixed condensers may be used to shunt other tube elements. Such a "frequency divider," properly used, gives much higher obtainable degree of accuracy than the ordinary commercially manufactured amateur meters AS USED IN THE AVERAGE AMATEUR STATION. Complete shielding is not necessary or even desirable in all cases. BUILD YOURS TODAY.

A. T. & T. report little improvement in the amateur interference situation on GBW's 14,440 kc. transocean radio telephone channel! A new British Post Office channel, 6905 kc, has been assigned GBS, taking the place of the 6990 kc. circuit. Already a number of amateurs have been logged on this channel, causing bad interference a whole 100 kc. outside the limits of the amateur band — and with commercial telegraph stations operating between the t.a. telephone and the amateur band constituting "landmarks" that can scarcely be overlooked by any amateur. The Liaison Officer at Fort Monmouth reports interference on the 6990-kc. Army Amateur channel also. Watch out. Trouble ahead. Unless you check frequency every time you go on the air, YOU MAY BE THE UNFORTUNATE STATION REPORTED BY A. T. & T. FOR ACTION.

Another thing. If you operate between 7200 and 7300 kc., watch out to see that no prominent second harmonics are radiated. Some of the "second offenders" have proved to be careless amateurs who neglect to check for the presence of harmonics, who overload tubes, using too high plate voltage, too high grid bias, close coupling to the radiator, low-C circuits, etc. Use high-C. Avoid overloading in the manner described. Energy radiated on the wrong frequency does not help signal strength on the frequency where you are working. On the contrary, it detracts from it. Lower the value of the grid leak some if this is the only way to eliminate the high bias causing distortion and harmonics. But lower the plate voltage anyway to reduce overloads. Loosen coupling. It will give you a better and steadier signal nine times out of ten. Above all check up transmitters thoroughly before using them for communication. After checking the main frequency, look for parasitics between the bands and harmonics that may be radiated where they get you into trouble.

Please note the limits of the following amateur bands:

QST FOR MAY, 1930

C.W. Telegraph
1715-2000 kc.
3500-4000 kc.
7000-7300 kc.
14,000-14,400 kc.

25,000-30,000 kc.
56,000-60,000 kc.

'Phone
1715-2000 kc.
3500-3550 kc.
Not permitted.
Special endorsement on station license required. Then, 14,100-14,300 kc.
Not permitted.
56,000-60,000 kc.

Use the standard frequency transmissions for checking monitors and calibrating secondary standards, also use the harmonics of broadcast station frequencies whose frequency precision is known by government measurements and publication in The Radio Service Bulletin.

The following stations are known to have a desirable degree of frequency stability. Since these stations operate regularly they may be helpful "markers" for use in checking calibration points from day to day, and in identifying the vicinity of the amateur bands:

NAA 4015 kc.	WIZ 6965 kc.
GBS 6905 kc.	WEN 7407.5 kc.
WEV 6942.5 kc.	WIY 13,867 kc.
WEN 6957.6 kc.	GBW 14,440 kc.

Warning signs are for YOU. These tips, other articles and comments appearing in every issue since November, 1929 are for YOU. Neglecting warnings spells TROUBLE, for YOU first, perhaps for all amateurs.

— F. E. H.

Check Your Frequency

By E. W. Mayer, K4KD*

SINCE the Washington Conference in 1927, amateur radio has become more and more an engineering proposition. The problem of frequency observance is our major problem today. This problem should be the first thought in the mind of every conscientious amateur.

Enough has been written in QST to fill volumes on the single subject of frequency measurement and off-frequency operation. But still an unbelievable number of stations can be found working outside of the prescribed bands, seemingly blissfully unaware of the dire results which may come to not only them, but amateur radio as a whole, from their illegal off-frequency work.

I wonder, to how many amateurs, has the idea occurred, that, barring "dusting accidents," "inquisitive fingers," etc., a transmitter, especially of the self-excited type, may shift in frequency without the knowledge of the operator, during some inoperative period. Hard to believe, but a concrete fact, for that very thing occurred at this station. Attention was called to the fact before any harm had been done, and, needless to say, great benefit was derived from the incident.

The point is this: had the transmitter frequency been checked, as it should have been, before going on the air, the error would have been discovered. Moral: check frequency always before you start up. Put faith in calibrated monitors but only when checked up regularly against reliable standards. Make it an iron-bound rule of your station operation to check the transmitter frequency when going on the air after a shut-down period. What is the value of two minutes

* Box 104, Ensenada, P. R., S.C.M. Porto Rico-Virgin Islands.

eaved, against the loss of your amateur privileges in their totality?

A PLEA TO "REAL" AMATEURS

I have just finished copying the official broadcast from W1MK, which all "real amateurs" should do, circumstances permitting. It seems that amateur radio in general is being placed in a very precarious position by a minority of "ham operators." Perhaps these fellows are not copying the official broadcasts in which our Communications Manager gives us the opportunity of obtaining first hand information on timely subjects.

A few pertinent facts brought to the attention of the better class of amateurs could do a world of good when placed in the right place. These amateurs must accept their opportunities to warn the careless element of delinquencies. In strict accordance with the Washington Communications Treaty (1927), our government has the privilege of curtailing our operation to any extent it may desire, even to the total cancellation of amateur privileges. We have a number of glorious good things written on the credit side of the ledger. The majority of recent entries cannot have been any place except on the debit side. It's the job of real amateurs, each and every one, to see that as many credits as possible are entered, and what is more important, to see that as few debits as possible reach the ledger. We all know there are limits to all things. Therefore, it isn't any flight of fancy to imagine that our government might, when other methods fail, curtail our privileges, make the requirements for the licensing of our stations and ourselves more difficult, or in an extreme, revoke our privileges altogether.

A sad fact, but nevertheless a true fact, is that the stations who need the timely warnings broadcasted by the official broadcasting stations are the very ones who do not copy these broadcasts. Therefore, it's up to each and every individual operator of the better class, copying these broadcasts, to make it a personal obligation to see that those who need the information contained in these broadcasts, get it and get it quickly. Every ORS should make it a duty to get these broadcasts, and make it a further duty to see that the needy ones get the information, and furthermore, that they use the information after it has been given to them. If it should appear after all this that the station and the operator in question is not trying to correct his situation, then there should be no qualms whatsoever about turning him in for official action. The sooner the careless slipshod operator is squelched, the better off will be our amateur radio.

It's not a matter of great importance to any station or operator whether he gets on the air or not. Therefore, if we can't be sure that we are operating legally within the bands assigned to us, then it is far more important that we don't go on the air. Personal pleasure is not considered more important than legality . . . and never will be. In view of all the information contained in QST, any operator who consistently operates outside of the bands, is doing nothing more than endangering amateur radio in general and advertising his real character to the whole world and amateur fraternity. In the Navy there is a saying that, "There is never any excuse for desertion which can be accepted by any court." Apply it to amateur radio and it becomes, "There is never any excuse for off-frequency operation which can be accepted by any supervisor." Make that a motto, keep it in mind always.

Remember it especially when you go on the air, and check that frequency by any or all of the best known methods. If you can't check it to your satisfaction, stay off the air until you can; much better be safe than sorry. Bring the golden rule into play. Wouldn't you be grateful if some other "good" operator called your attention to your frequency when it had strayed out of the band? Then do as much for the fellow you bar out of the band if at all possible. By so doing, you will be protecting your own interest, the interest of that operator, and the interest of the whole amateur fraternity.

W1MK

A.R.R.L. Headquarters' Station W1MK operates on frequencies of 3575 kc. and 7150 kc. Robert B. Parmenter, "RP," is the chief operator; his fist is familiar to most of the amateur fraternity. Occasionally other members of the Headquarters' staff operate at W1MK. Their personal signs may be found in the QRA Section of QST.

Throughout the following schedules Eastern Standard Time will be used.

OFFICIAL AND SPECIAL BROADCASTS are sent simultaneously on 3575 kc. and 7150 kc. at the following times:

8:00 p.m.: Sun., Mon., Tues., Thurs., and Fri.

10:00 p.m.: Mon. and Fri.

12:00 p.m. (midnight): Sun., Tues., and Thurs.

GENERAL OPERATION periods have been arranged to allow every one a chance to communicate with A.R.R.L. Headquarters. These general periods have been arranged so that they usually follow an official broadcast. They are listed under the two headings of 3500 kc. and 7000 kc. to indicate whether the watch is devoted to listening on the 80-meter band or to the 40-meter band.

3500 kc.

8:10 p.m. to 9:00 p.m. on Sun., Mon., Tues., Thurs., and Fri.

10:00 p.m. to 11:00 p.m. on Tues. and Thurs. (No OBC sent before these periods.)

12:00 p.m. to 1:00 a.m. (or later) on Sunday night (Monday morning).

7000 kc.

10:10 p.m. to 11:00 p.m. on Sun., Mon., and Fri.

12:00 p.m. to 1:00 a.m. on the following nights (actually on the morning of the day following): Mon., Tues., Thurs., and Fri. (Only on Tues. and Thurs. does the OBC precede these periods.)

SCHEDULES are kept with the following stations through any of which traffic will travel expeditiously to A.R.R.L. Headquarters, on 3500 kc.: W1ACH, W1BOD, W1BXB, W1ZA, VE1AY, W2JF, VE2AC, W3BWT, VE3DA, VE3ET, W8ARX, W8CEO, W9OX, VE9AL; on 7000 kc.: W4FT, W4SK, K4KD, W6CIS, W6DEP, W6OJ, and W9YC.

Traffic Briefs

WSAPQ sends us a list of "Prehistoric Signals" which he classifies as follows: W8DDK, scattered A.C. 100 kc.; W3LC, W4UY, W2AVE, W2GP, "Comet" 30 kc.; W8CH, W9AJ, "Comet" 40 kc.; W8CXT, "Comet" 20 kc.; W5APU, "Comet I.C.W." 100 kc.; W8AVV, "Double I.C.W."; W9DRR, "Double I.C.W." 90 kc.; W8AJ, I.C.W. 30 kc.; W9BRC, A.C. 40 kc.; W9FTZ, "Hard A.C." 30 kc.; W2BUA, "Click" 80 kc.; VE3JW, "Scattered" 40 kc.; W4ZI, "Triple hash" 100 kc. A "Comet" is a signal with a head or nucleus and a long tail on one side. "Double" or "Triple" means that the signal could be heard at several places on the dial. 20 kc., 30 kc., 40 kc., etc., indicate the width of the signal.

According to information received from W2AKG, twenty-two colleges are now members of the College Radio Union. As has been explained in previous issues, the purpose of the Union is to provide an organized system whereby the results of various school games can be relayed, news and student messages can be exchanged, and all college hams can be drawn closer together. College radio clubs in all parts of the world are invited to join the CRU and should write to the Executive Committee, W3IS and W3IX, at the George Washington University Radio Club, Washington, D. C.

Just before PMZ, the station of the All-American Lyric Malaysian Expedition, left Borneo, Captain Dequant, the Dutch Commandant at Poerok-Tjho, where PMZ was stationed, was murdered by hostile Malays. Operator Wells of PMZ very ably assisted the next in command in sending radio dispatches. He succeeded in putting several through KAIAF and KAICY. The first message, which went through on Christmas Day, was a notification to the Dutch authorities in Bandjermasin. An answer was received via KAIAF on the following day. From that time until the expedition was ready to leave, messages were exchanged between the Dutch authorities in Bandjermasin and those in Poerok-Tjho. This coöperation proved very helpful to the authorities and is just another case where amateur radio showed its colors in an emergency.

Traffic Summaries

(FEBRUARY-MARCH)

Pacific led by San Francisco	13,270
Central led by Ohio	4714
Atlantic led by Western Pa.	3988
New England led by Eastern Mass.	3513
Dakota led by Southern Minnesota	3486
Midwest led by Iowa	3004
Hudson led by Eastern New York	2730
Northwestern led by Oregon	2198
Southeastern led by Ga.-S.C.	1919
West Gulf led by Southern Texas	1708
Delta led by Arkansas	1132
Rosnoke led by North Carolina	852
Rocky Mountain led by Colorado	362
Quebec	302
Prairie led by Saskatchewan	165
Ontario	142
Vanalta led by Alberta	142

809 stations originated 10,476; delivered 8753; relayed 24,290; total 43,627. (83.7% del.)

At last the Los Angeles and East Bay Sections are given a little competition! *San Francisco* leads the country this month with a total of 3960 and carries the Traffic Banner. FB *San Francisco*! The Traffic Banner goes each month to the section with the largest total of real messages. A traffic summary showing the standing of the various divisions for the past month is printed above. What place does yours take? What Section will carry the Banner next month and help its Division head the list?

Traffic Briefs

From northern Minnesota we receive information regarding a bit of emergency work carried out by amateur radio operators in that neck of the woods. When an air-mail plane crashed in a snowstorm on Lake of the Woods, the news of the safety of the pilot was first reported by amateur radio from W9CYY at Oak Island to W9ZC at Baudette. Rescue work went on over stations W9ZC, W9CYY and W9ENN. W9ZC gave the first news of the rescue to the press.

7000 KC. AND BETTER OPERATING

Everybody seemingly gets disgusted with 7000 kc. and its maelstrom of QRM, yet I wonder how many realize that this band can help us improve our operating skill. QRM is probably worse on 7000 kc. than on any of the other amateur bands, but cussing doesn't get us anywhere. It takes practice and concentration to master QRM.

Try keeping a note of how many complete QSOs you are now having on 7000 kc., and then start using that medicine called "concentration and patience." You will soon find that your percentage of complete QSOs will take an upward step. And remember, if you can conquer the 7000-kc. QRM on a busy evening, you can safely high-hat many a commercial operator.

While on the subject of QRM, let me link it with traffic handling and offer a couple of suggestions for better operating practice. When we are troubled by QRM and miss some of a message, we ask the other fellow to "RPT." Many times he will come back with the "RPT" at a much slower speed, simply because you told him, "QRM." Nine times out of ten our chances of getting the "fill" are much greater if he will step on it. Do not slow down or send double unless it is requested! Just because QRM is reported, don't get scared and forget all the rules of good operating practice.

Many times the following procedure does away with requests for "RPTS": Send the message once, then go back and repeat the number, check, origin, address and signature. This is one form of commercial procedure and should work just as well in amateur traffic handling. The parts repeated are in most cases the questionable parts, and the parts on which repeats are asked. Try this some time.

— John H. Gullans, W2AWU

The Toledo Amateur Radio Club is now going "full steam ahead." Every member is also an A.R.R.L. member. Meetings are held each Friday night with technical dis-

cussions, blackboard talks, etc. Code classes are conducted each Monday night as a help to beginners, and at the present rate, the Club's slogan will soon be "Every Toledoan a Ham."

W2API, well known for his transatlantic and foreign contact work, has had many interesting experiences in those fields. He tells us how a man virtually "talked" with his brother in Berlin, when W2API worked D4AW and had him call the brother on the 'phone. A two-way conversation ensued, W2API and D4AW putting on the air what each brother said. On another occasion when W2API was in Europe, his brother operated his station and maintained a daily schedule with him. He says, "You can never imagine the real thrill of radio until you hear your own signals three thousand miles away."

A route lined up as follows links the west coast of the United States with England: W6TM-W6ERK-W9COS-W2API-W6VP.

BRASS POUNDERS' LEAGUE

Call	Orig.	Del.	Rel.	Total
W6AD	163	378	1084	1625
KA1HR	266	221	496	983
W8YA	104	139	445	688
W9COS	106	286	490	882
W6HP	19	22	745	786
W6ERK	39	136	398	573
W1MK	90	114	311	515
W9EJQ	12	27	464	503
W9BVF	144	68	288	500
W9BN	234	133	110	477
W6AKB	115	9	340	464
W3BWT	120	78	243	441
W8QU	185	220	10	415
W6ETJ	32	64	286	382
W8CNO	14	11	328	353
W2LU	68	18	244	330
W2CXL	114	61	140	315
W6ETR	296	4	10	310
W4HU	75	5	226	306
W6AKW	49	17	236	302
W6BZY	47	68	182	297
W6CBW	28	63	198	289
W6WA	86	136	60	282
K4AAN	121	116	44	281
W6ACJ	28	29	223	280
W6DJJ	49	5	130	284
W6EIB	6	6	250	262
W6AYC	200	10	50	260
W5AHI	4	15	220	239
W9CKM	64	26	148	238
W2SC	42	63	130	235
W6ALX	5	68	156	229
W9CFL	25	192	12	229
W6YG	154	22	52	228
W3NF	13	12	200	225
W6ATT	23	13	186	222
W7ALM	55	15	144	214
W6ESA	70	32	108	210
K4KD	100	110	...	210
W9CTW	2	8	198	208
W9DGS	46	30	127	203
W6AKD	4	4	198	203
W9DRG	162	37	2	201
W6HM	60	122	5	187
W3ZF	43	108	36	187
W9DJK	52	75	56	183
KAICY	63	41	48	152
W6DBD	12	53	87	152
W9UM	57	69	2	128
W7ZD	50	72	6	128
W2AVP	4	81	42	127
W2JF	16	55	45	116
W5AOD	21	56	32	109
W6DIJ	26	60	18	104
W9ANQ	23	55	12	90

The several amateur stations responsible for the best traffic work — the ones that are "setting the pace" in worthwhile traffic handling — are listed right up near the top of our B.P.L., the figures giving the exact standing of each station accurately.

All these stations appearing in the Brass Pounders' League are noted for their consistent schedule-keeping and dependable message-handling work in amateur radio. Special credit should be given to the following stations in the order listed responsible for over one hundred deliveries in the message month: W6AD, W9COS, KA1HR, W2QU, W9CFL, W8YA, W6ERK, W6WA, W9BN, W6HM, K4AAN, W1MK, K4KD, W3ZF.

Deliveries count! A total of 200 or more bona fide messages handled and counted in accordance with A.R.R.L. practice, or just 50 or more deliveries will put you in line for a place in the B.P.L. Why not make more schedules with the reliable stations you hear and take steps to handle the traffic that will qualify you for B.P.L. membership also?

OFFICIAL BROADCASTING STATIONS

(Local Standard Time)

CALL	FREQUENCY	SCHEDULES	CALL	FREQUENCY	SCHEDULES
W1AJC	7110	Tues., Thurs., Sat., 6:00 p.m.	W7FL	7142.8	Mon., Wed., Fri., 11:30 a.m.
W1ANH	3980	Mon., Wed., Sat., 7:15 p.m.; Tues., Sat., 10:00 p.m.	W7FL	14285.7	Sun., 3:00 p.m.
W1APK	7200	Wed., Fri., 5:30 a.m.; Sunday 8:00 a.m.	W7FL	3540 (phone)	Tues., Thurs., midnight.
W1APK	3600	Tues., Thurs., Sat., 9:00 p.m.	W7HP	7000	Mon., 6:00 p.m.; Thurs., 7:00 p.m.
W1AQL	3670	Mon., Wed., Fri., 7:00 p.m.; Sun., 6:00 p.m.	W7IZ	7140	Sun., Thurs., 9:00 p.m.
W1ATJ	3950	Daily, 6:30 p.m.	W7IZ	28,000	Sun., 1:00 p.m.
W1CDX	3950	Tues., Thurs., Sat., 6:15 p.m.; Sunday, 3:00 p.m.	W7JC	7150	Whenever possible to work set.
W1MK	3575, 7150	Sun., Mon., Tues., Thurs., Fri., 8:00 p.m.; Mon., Fri., 10:00 p.m.; Sun., Tues., Thurs., 12:00 midnight.	W7PL	7200	Tues., Thurs., 9:00 p.m.
W2AET	7140	Tues., Thurs., Fri., 7:00 p.m.	W8AFM	14,308	Sun., 12:15 and 7:00 p.m.; Mon., Wed., Fri., 12:15 p.m.
W2AZV	3660	Sun., Wed., Fri., Sat., 7:15 p.m.; Sat., 12:30 p.m.	W8AFM	7018	Mon., Wed., Fri., 7:00 and 9:00 p.m.
W2BGO	3636.3	Daily except Tuesday, 3:00 a.m.	W8BRO	7000	Mon., Fri., 1:00 p.m.
W2BO	7130 (cc)	Sat., Sun., 12 midnight.	W8BWP	7160	Mon., Tues., Thurs., 7:30 p.m.; Sat., 10:30 p.m.
W2BTY	14,250	Daily, 5:30 p.m.	W8CEO	3705	Mon., Wed., Fri., 7:00 p.m.
W2BTY	7150	Daily, 10:30 p.m.	W8CRA	14,020	Mon., Tues., Sat., 5:30 p.m.; Sun., 6:00 a.m.
W2FF-	14,200	Sun., 9:30 a.m.; Tues., 7:30 p.m.	W8DLG	7200	Tues., Thurs., 7:00 p.m.; Sun., 7:00 a.m.
W2HIX	3910 (cc)	Mon., 8:30 p.m.	W8DLG	3900	Sun., 2:30 p.m.; Sat., 1:45 p.m.
W2PF	3850 (cc)	Mon., 8:30 p.m.	W8DME	14,300	Sat., 7:00 p.m.
W28C	7300, 3665	Mon., Tues., Thurs., 7:00 and 10:30 p.m.	W8DME	3650	Mon., 7:00 p.m., also several times on Sunday, 14,160 kc. (phone cc).
W3ALE	7300, 3665	Mon., Tues., Thurs., 7:00 and 10:30 p.m.	W8DQP	3940	Tues., Thurs., Sat., 6:30 p.m.; Sun., Mon., 7:00 p.m.
W3BWT	3680	Sat., 7:30 p.m.	W8DRJ	7010	Sat., Sun., 4:00 p.m.; Mon., Wed., Fri., 10:30 p.m.
W3CKL	7040	Sun., 10:30 a.m.	W8EQ	7150 (cc)	Thurs., 9:00 a.m.
W3CKL	14,080	Tues., Thurs., Fri., 6:30 p.m.	W8FL	7030 (cc)	Mon., Wed., Fri., 5:30 p.m.
W4AA	7200	Daily at noon and 9:00 p.m.; Tues., Fri., midnight; Daily except Sunday, 6:00 p.m.	W8ACU	7100	Tues., 12:15 p.m.; Sun., 9:30 a.m.
W4AA	3600	Daily except Sunday, 7:00 p.m. and 9:30 p.m.	W9ACU	14,200	Wed., 6:30 p.m.
W4AH	7130, 7272 (cc)	Mon., Wed., Fri., 6:30 p.m.; Sun., 11:30 a.m.	W9AIR	1750	Wed., 8:30 p.m.
W4AH	3515 (cc)	Tues., Thurs., 6:30 and 9:00 p.m.	W9AIR	3900	Mon., Fri., 8:30 p.m.
W4NG	14,200	Mon., Wed., Fri., Sun., 4:30 p.m.; Daily at 8:00 p.m.	W9BAN	7175	Mon., Wed., Fri., 11:30 p.m.
W4NRC	1440	Daily except Sunday, 5:00 p.m.; also on voice at 5:45 p.m., daily except Sunday.	W9BAX	7150	Mon., Tues., Wed., Thurs., Fri., 12:15 p.m.
W4AHP	3650	Tues., Thurs., Sat., 7:00 p.m.	W9BEF	7000	Tues., Fri., 11:00 p.m.
W4HK	3750	Mon., Wed., Fri., 11 p.m.	W9BEF	14,000	Sun., 5:45 p.m.
W4HK	7120	Mon., Wed., Fri., 7 p.m.	W9BEU	14,320 (cc)	Daily at 7:00 p.m. and 9:30 p.m.
W4MS	7100	Mon., Tues., Wed., Thurs., 4:30 p.m.	W9BEU	7160 (cc)	Daily at 7:00 p.m. and 9:30 p.m.
W5AHP	7116 (cc)	Tues., Thurs., 8:00 a.m.; Mon., Wed., Fri., 1:00 p.m.	W9BJA	3660	Sun., 7:30 p.m.; Mon., Wed., Sat., 8:00 p.m.
W5AKP	7200	Sun., Tues., Fri., 7:30 p.m.; Sat., 4:30 p.m.	W9BJA	7140	Mon., Thurs., Sat., 3:30 p.m.
W5AQX	7160	Sat., Sun., Wed., 9:00 a.m.; Sun., 11:00 p.m.	W9BJA	1760	Sun., Thurs., 8:30 p.m.
W5ASQ	7100	Tues., Thurs., 7:30 p.m.	W9BKJ	3808	Tues., Thurs., 7:00 p.m.
W5BAT	7220 (cc)	Mon., Wed., Fri., 8:00 p.m. (Sun- day afternoons several times)	W9BVF	3740	Tues., 7:00 p.m.
W5KX	3522	Mon., 11:00 p.m.	W9BVF	7060	Thurs., 10:45 p.m.
W5MM	7290	Tues., Thurs., Sat., 7:45 p.m.	W9BVF	14,100	Sun., 10:00 a.m.
W5RH	7150	Daily at noon.	W9CBK	7100 (cc)	Daily at 11:00 a.m. and noon.
W5BHF	7000	Mon., Wed., Fri., 7:00 p.m.	W9CCS	7030	8 p.m. daily except Sat. and Sun.
W5ABK	7060	Mon., Wed., Fri., 5:30 p.m.	W9CSR	14,000	Sat., 5:00 p.m.; Fri., 7:00 p.m.; Sun., 10:30 a.m.
W5AFU	7100	Sun., 6:30 a.m.	W9CTW	7160	Mon., Wed., Fri., 1:00 p.m.
W5AKW	7000	Tues., Thurs., 7:00 p.m.	W9DBJ	7000.4 (cc)	Sun., 6:30 p.m.; Mon., 7:00 p.m.
W5AMM	7190	Wed., Fri., 7:00 p.m.	W9DFG	....	Mon., Wed., Fri., 5:00 and 10:00 p.m.; Tues., 1:00 and 5:00 p.m.; Thurs., 1:00 and 10:00 p.m.; Sat., Sun., 1:00, 5:00 and 10:00 p.m.
W5AXE	7250	Mon., Tues., 10:00 p.m.; Wed., Fri., midnight.	W9DHP	14,150	Mon., Wed., Fri., 7:30 a.m., several times on Sunday.
W6AWT	3525	Tues., Thurs., Sat., 10:30 p.m.	W9DQN	7100	Mon., Wed., Fri., 9:30 a.m. and 11:00 p.m.; also on Fridays, follow 11:00 p.m.iked on 3:00 ke.
W6AWT	14,280	Sun., 10:30 p.m.	W9DUD	14,000-7000,	Wed., Sat., 7:30 p.m.; Mon., 7:30 a.m.
W6BIP	14,000	Tues., Thurs., Sat., 6:00 p.m.	W9DXP	1715	Sun., 5:00 p.m.; Sat., 6:30 p.m.
W6BIP	7000	Mon., Wed., Fri., 8:00 p.m.	W9DXP	14,180	Sun., 10:00 p.m.; Wed., Fri., 6:30 p.m.
W6BRO	7100	Mon., Wed., Fri., 7:30 a.m.	W9DXP	7090	Mon., Fri., Sat., 10:00 p.m.
W6BYH	3600	Daily at 10:00 p.m.	W9DXZ	3680	Mon., Wed., 7:30 p.m.
W6BYH	7100	Daily at noon.	W9EGU-	3725	Daily except Sunday, 7:00 p.m.
W6CLS	3660	Mon., Wed., Fri., 7:00 p.m.; Tues., Sun., 10:30 p.m.	W9EGU-	7094	Mon., Tues., Wed., Thurs., 9 p.m.; Sat., 6 p.m.
W6DKV	7150	Mon., Wed., Fri., 6:30 p.m.	W9EPX	3836 (cc)	Tues., Wed., Fri., Sat., 11:00 p.m.
W6ZZI	7150	Thurs., 9:30 p.m.	W9EPY	3855.5 (cc)	Mon., Tues., Fri., 8:30 p.m.
W6DTE	7000	Tues., Wed., Fri., 10:30 p.m.	W9EPY	7206 (cc)	Mon., Fri., 9:45 p.m.
W6EDD	7300	Tues., Wed., Thurs., Sat., 6:00 p.m.	W9FFD	3870	Daily except Sun., 9:00 a.m.
W6EDK	3955	Daily, 7:00 p.m., 7:30 p.m.	W9FYM	7150	Sun., 2:00 p.m.
W6EGH	14,000	Daily except Sunday, 6:00 p.m.	W9GDU	7000	Sun., 4:45 p.m.; Mon., 6:45 p.m.; Tues., 9:00 p.m.; Sat., 2:45 p.m.
W6ESA	7140	Mon., Wed., Fri., 5:00 p.m.	W9SO	7120	Mon., Wed., Fri., 1:00 p.m.
W6TE	7000	Mon., Fri., 6:30 p.m.	W9ZD	7045	Mon., 10:30 p.m. (when able to copy WIMK's B/C on Thurs- day, will broadcast it at 10:30 p.m. Sat.
W6TE	14,000	Wed., 6:00 p.m.	K4KD	7075	Mon., Fri., 11:00 p.m.
W7AAT	7040	Mon., Wed., Fri., 3:00 p.m.			
W7AAT	3755	Tues., Thurs., Mon., 11:30 p.m.			
W7AAW	7150	Mon., Wed., Fri., 2:30 p.m.			
W7DD	7200	Mon., Thurs., 6:30, 10:30 p.m.			
W7DD	3900	Tues., Sat., 10:30 p.m.			
W7DD	14,200	Sun., 1:00 and 4:00 p.m.			

ARMY-AMATEUR NOTES

FIRST CORPS AREA: Things are beginning to move, and other Corps Areas are given fair warning that the "First" is out for blood this time. We are building up the net slowly, from live stations only, and the stations now in the net are subjected to a periodical pruning operation that is a guaranteed dead-wood remover. AARS in this area, from now on, is going to mean "All Active Radio Stations." A list of those in the net will be published in an early issue.

SECOND CORPS AREA: WSAHK, NCS of the Western New York State Net, has been forced to resign due to business pressure. WSBYO has been appointed acting NCS. W2SJ, W2PFX and W8DSA are new stations in the Eastern New York State Net. The Southern New York State Net has a new station in W2AHG. The four stations in the Westchester District Net are actively engaged in Monday schedules under NCS W2BQD. W2AOS, NCS of New Jersey State, continues to hold down his end of the Net in fine shape. W2DV is a new station in this Net. W3MA, Delaware State NCS, recently made a good showing during the inspection of the 198th C. A. in Wilmington Armory when a message from the Inspecting Officer was forwarded to the Armory of the 245th C. A. in Brooklyn and reply received within fifteen minutes. W3MA and W2PF helped in this work. Porto Rico has been added to the Second Corps Area A-A Net, and K4KD is the NCS. All amateurs are invited to listen to the "ZLV" sent by W2SC at 8:30 p.m. every Monday on 3876 kc. and to copy the news contained therein. Dr. L. J. Dunn, W2CLA, Chief Radio Aide, has been promoted to Major in the Signal Corps Reserve.

FOURTH CORPS AREA: These notes are submitted by J. W. Spratlin, Radio Aide for the Area. Any news pertaining to activities in this area should be addressed to the Corps Area Net Control Station, WLR, 83 Rogers Street, S. E., Atlanta, Georgia. The Alabama State Net is exceptionally well organized and the state control and alternate control stations, W4AHR and W4AAQ, have been handling the work with clock-like regularity. W4AHA is State Control station for South Carolina. W4AEW has been carrying most of the load for North Carolina, but W4ACI is expected back on the job soon. W4Pm, Georgia State NCS, is getting a good state net organized. W4AFS, the Tennessee NCS, is working hard and has a state net working very well. The states of Florida, Mississippi and Louisiana are not so well organized. We would like to have any station answer the CQ sent from WLR on 6990 kc. each Monday between 6:30 and 7:30 p.m. and between 8:30 and 9:30 p.m. C. S. T.

FIFTH CORPS AREA: The Kentucky State Net has been making rapid progress, and is now pushing West Virginia and Ohio for top honors. W8JC, Ohio NCS, has moved from Columbus to Dayton. W9GKI of Anderson, Indiana, has moved to Columbus. W8OK and W9EZ have new outfits for A-A work and as a result are putting out better signals. Signal Corps literature and monthly bulletins are sent to all our stations. Our chief object is to develop the spirit—"Pro Patria Vigilans."

Traffic Briefs

W3AWM was erroneously listed as W3AHM in the BPL in April *QST*. We wish to correct this at this time and credit W3AWM with the splendid total of 640 for the January-February reporting month.

The high frequency broadcasting schedules of HS1PJ, Bangkok, Siam, have been temporarily suspended. HS2PJ has replaced HS1PJ and tests are usually carried out on Sundays, Tuesdays and Fridays from 1300 to 1600 G.M.T. HS2PJ uses a frequency of 10,170 kc. (29.5 meters). Any QST readers who hear the broadcasts are requested to report reception to Engineer Service, Royal Siamese Post & Telegraph Department, Bangkok, Siam, or direct to the A.R.R.L.

High Quality Signals

3500-ke. band: W1AAT*, W1AJB*, W1AKR, W1AMQ, W1ATT, W1BDX, W1BKQ, W1BVR, W1BXX, W1CDG, W1CGX*, W1CTB, W1DS, W1FH, W1HG, W1IT, W1MK**, W1QI, W1WV, W1ZA*, W2ACB, W2AG, W2ALS, W2AV, W2BUW, W2CWK, W2CXL**, W2DV, W2IH, W2LW*, W2PF, W2PX, W2SC**, W2UK, W3ARU, W3ASI, W3ASW, W3ATN, W3AQW, W3BBW.

QST FOR MAY, 1930

W3BF*, W3BO, W3BTA, W3IC, W3OC, W3OZ, W3QP,
W3QV, W3UK, W3UN*, W3UX, W4AAQ, W4PM,
W5AGS, W6NZ, W8ACU, W8AJC, W8AKD, W8AN*,
W8AOR, W8ASK, W8AYJ, W8BBC, W8BDM, W8BGW,
W8BHW, W8BKM, W8BYM, W8CLI, W8CNO*,
W8COW*, W8CR, W8CSB***, W8CUG, W8DED, W8DFS,
W8DPS, W8EO, W8HL, W8JW, W8KR*, W8LT*, W8PK,
W8QL***, W8WJ, W9ANQ, W9BKJ***, W9BZO***,
W9BDJ, W9BLL, W9BN, W9CCP, W9CFL*, W9CIR,
W9CYQ*, W9DGD, W9DLQ*, W9DRE, W9DSC*,
W9DXZ*, W9EAM, W9EHD*, W9EJQ, W9ELL, W9EME,
W9EMR, W9ENF*, W9EOP, W9EPO, W9ESE, W9EYH,
W9FAW, W9FUD, W9FVO, W9GCL, W9GCP, W9GKF,
W9GX, W9YI*, VE2BB, VE2BE, VE2BZ*, VE3DA,
VE3GC, G5BY, ON4FT, LU8DY, CT1BX.

7000-ke. band: W1AEK, W1ARJ, W1AWK, W1AXV,
W1AZE, W1BIL, W1BJD**, W1COW, W1DP, W1WHA,
W1ID**, W1KH, W1MK****, W1SZ*, W1VY*, W1WA,
W1WY*, W1ZA, W1ZD, W2ADL*, W2AEY*, W2AG*,
W2AI, W2AIB, W2ALO, W2AOF*, W2ASG, W2AUN,
W2BHR, W2BJJ, W2BPN, W2BR0, W2BSC*, W2BXN,
W2CUQ, W2CXL**, W2FL**, W2FN*, W2FP*, W2GP,
W2HN, W2JC*, W2JN*, W2MB*, W2QF, W2QN**,
W2RD, W2RT*, W2UK****, W2UX, W3AIY,
W3ANH***, W3APR, W3AQI, W3ARU, W3AUU,
W3BA, W3BUF, W3DR, W3HL, W3LA, W3MC, W3QV,
W3TB*, W3UI*, W3VB, W4AFQ, W4AHA, W4AKQ,
W4EI**, W4HE, W4IS, W4LL, W4NH, W4OC*, W4PX,
W4TY, W4UM, W4WE*, W5AAJ, W5AAV, W5AEM*,
W5AFN, W5AHI, W5AJL, W5ANA, W5ANE, W5ANH,
W5BMD, W5CZ, W5JC, W5NK, W5QL, W5TV, W5ZAV,
W5ZG, W6ABI, W6AC, W6ACL*, W6AD, W6AIX,
W6AM*, W6AMI, W6AOA, W6BSN, W6BVS, W6CUD,
W6CUH, W6DCV**, W6DBD, W6DFS, W6DGO,
W6DLN, W6DPF, W6EIF*, W6EOP, W6EPP, W6ERK,
W6ESA, W6HM**, W6KD*, W6LO, W6PQ, W6PW,
W6QL, W6SC*, W6TM, W6WB, W6WM, W6WN, W6YX,
W6ZZO, W7ABD, W7AIQ, W7AOQ, W7EK, W7LP,
W7MP, W7YA, W8ADG, W8ADU, W8AGI, W8AHC,
W8AHN, W8AIO, W8AJT, W8AQ, W8ARK, W8ATH,
W8AUU, W8ABY, W8BAU, W8BDU, W8BFG, W8BGV,
W8BM, W8BNT, W8BRs, W8BYN, W8CAU*, W8CFL,
W8CIB, W8CLI, W8CNA, W8COW, W8CPC, W8CSU,
W8CUD, W8CVQ, W8DGB, W8DII*, W8DJP, W8DKT,
W8DME, W8DMN, W8DOS, W8DPO, W8DXV, W8EQ*,
W8GZ, W8HL, W8LT**, W8NP, W8PL, W8SG, W8SU,
W8TK, W8WJ, W8WK, W8YB, W9AAB, W9ABD*,
W9ABU, W9AFN, W9ALK, W9AMR, W9AAN*, W9ANZ,
W9AP*, W9AQ*, W9ARA, W9AU, W9AVP, W9AWY*,
W9AYD, W9AZY, W9BEU, W9BFb, W9BHZ, W9BIR,
W9BIW, W9BOA, W9BDP, W9BQL, W9BTO, W9BVH,
W9BZO*, W9CAa, W9CBK**, W9CCP, W9CCS, W9CHR,
W9CJC, W9CKQ, W9COS*, W9CTW*, W9CUC,
W9CVN**, W9CVT, W9CWX, W9DBJ**, W9DEF,
W9DFT, W9DGZ*, W9DNK, W9DRV, W9DXP*,
W9DXZ, W9DZX, W9EBO*, W9ECZ, W9EGU, W9EGW,
W9EHD*, W9EHI, W9EJI, W9ENS, W9EOC, W9ERU,
W9ERV, W9EXW, W9FEC, W9FEQ*, W9FHU, W9FRQ,
W9FTA, W9GCP**, W9GDH, W9GIU, W9GKL, W9KB*,
W9KD, W9NR*, W9PA*, W9SJ, W9YCV, VE2AP, VE2AY,
VE2BE*, VE2CA**, VE3EO, VE3LL, VE4AI, VE4BX,
VE4FX, VE4HU, VE5AO, VE5AV, VE9AL*, VK3ES,
VK3HL*, VK3JK**, VK3VP, VK5IT, VK7DX, ZL2AC,
ZL2BG, PY1AB, PY1BG, PY1CL, PY2BF, PY2BG,
CE3BF, CM2XA, CV504, KA1CM, KA1JR, K4KD*,
KE1DV, G5BY, G5IS, IPH, VS1AB, VS6AH, ON4DJ,
E4R140, LU6FC, X2R, X9A*.

14,000-ke. band: W1AFC, W1AXV, W1BJD, W1DP, W1VY, W1WE, W2AEY*, W2AXL, W2AOG, W2BA, W2BG, W2BSF, W2FL*, W2JN*, W2MB***, W2RA, W3AQI, W3PF, W3UX, W4EJ*, W4LM, W4MR, W4PJ, W4UM, W5AEA, W6ACL*, W6AQJ, W6CUH*, W6DCV*, W6DLN, W6OJ, W7ACY*, W7BE, W7EL*, W7LI, W7MO, W8AFS, W8AGD, W8BDZ, W8BHO, W8CPC, W8CUT*, W8DGX, W8DLD, W8MT, W8RD, W8VS, W9ABU, W9ARK, W9ASL*, W9BFB, W9BII, W9COK*, W9DEF, W9DGH, W9DGG, W9DQU, W9DXL, W9EVB, W9FCW, W9GRF, W9FYC, W9GHI, W9GIY, W9SJ, VE2CA*, VE4AI*, VE4BU*, VE4BX, VE4FX*, VE4HR, VE4IC, VE4RR, VE5AL, VE5AO, VE5AW, VK4RB, G2UX, G5BY, G5IS, G5ML, G6VP, G6XB, PY1AA***, PY2BG, ON4DJ, ON4JJ, ON4UU, EAR155, F8EX, LU3DH.

28,000-ke. band: W6BAX, W6BLV, W6BTO, W6CAW, W6CIX, W6EC, W6EIF, W6KJ, W9AOD, G5BY.

GOOD 'PHONES

3500-ke. band: W1AAR, W1AEZ, W1AMQ, W1CGR*, WICKI, W1CMT, W1IF, W1QK, W2AII, W2BAJ, W2BEE, W2BRW, W2BWC, W2FF, W2GJ*, W2IU, W2ST, W3ABN, W3AEX, W3BFZ, W3CGD, W3DY, W3VM, W3ACI, W3AFQ, W3AJH, W3AOS, W3BXY, W3BYC, W3BYR, W3CPL, W3DBQ, W3DEC, W3DTK, W3IH, W3WF, W3BJW, W3BWI.

14,000-ke. band: W1CEI, W2AIP, W2EL, W2QN, W3AY, W3QL***, W6KP, W6KT, W8DLD**, W8RD**, W9AMZ, W9ANZ**, W9ELX, W9QY.

WELL-OPERATED STATIONS

W1AFB, W1ASF, W1MK***, W2AEY, W2BCC, W2CXL**, W2FL, W2FP, W2JF, W3AWM, W3AWS, W3LA, W4AEF, W4UM, W4WE, W6AD, W6AKW, W6AMW, W6AYC, W6CIS, W6EIB*, W6ERK, W6NJ, W6XBB, W6ZF, W6YC, W7LP, W8AHC, W8BKM, W8BYN, W8CFT*, W8DIL, W8DYH, W8CSB, W8JD, W8LD, W8LT, W9ABU, W9AFN, W9BKJ, W9BZO, W9COS, W9CYQ, W9DGO, W9DXC, W9DXZ, W9EGU, W9EJF, W9ERU*, KA1CM*, KA1DJ, KA1HR*, K6AVL, VE3DD, VK3JK, ZL2AC, ZL4AO.

Inconsiderate and Prehistoric Signals

3500-ke. band: W1ABH, W1AVC, W1BSO, W1JR, W1NI, W2AFV, W2AIK, W2AVE, W2CTN, W3BS, W4AFS, W6CUL, W8BCN, W8CEI, W8DXM, W9AYF, W9FFD.

7000-ke. band: W1AGK, W1AKC, W1ASP, W1AWE, W1BCN, W1BKF, W1BSB, W1BUX, W1CMX, W1CMZ, W1VI, W1VP, W2AIO, W2ALU, W2ARR, W2AU, W2AZD, W2BAI, W2BIA*, W2BM, W2BOX, W2BTD, W2BUX, W2BXW, W2CJE, W2CTN, W2CVJ, W2FD, W2KU, W2VT, W2WZ, W3AAH, W3AMP, W3BKT, W3BNU*, W3NS, W3ZK, W4AAQ, W4ABJ, W4AEF, W4AKP, W4AL, W4ER, W4GJ, W4GQ, W4GR, W4GV, W4HB, W4HU*, W4IK, W4IT, W4LT*, W4OO, W4UB, W5ABI, W5ACY, W5AIN*, W5AKP, W5AQY, W5ARO, W5BG, W5BII, W5FQ, W5GP*, W5KC, W5RF, W5RJ, W6AGF, W6AHP*, W6ANJ, W6ASH, W6AVJ, W6AY, W6BDX, W6BGX, W6BIP, W6BJF, W6BXL, W6BXV, W6BYK, W6BZS, W6CAD, W6CBW, W6CCD, W6CWI, W6CZC, W6DEP, W6DMQ*, W6DWT, W6EBS, W6EDV, W6EEB, W6EGR, W6EMD, W6ESB, W6HJ, W6YG, W7QD, W7SQ, W8AA, W8AED, W8AGB, W8ALB*, W8ARL, W8ARP, W8BDZ, W8BJO, W8BWD, W8BWK, W8BZC, W8CFT, W8CH, W8CHC, W8CLD, W8CMX, W8COD, W8CU, W8CZD, W8DOR, W8DUQ, W8EZ, W8PM, W8TI*, W8UT, W8WI, W9ADS, W9AJA, W9AJP, W9AKZ, W9AMV, W9AOG, W9AS, W9AWA, W9AXO, W9BDS*, W9BDW, W9BE, W9BIZ, W9BKU, W9BKZ*, W9BNF, W9BSH, W9BSR, W9BTL, W9BVO, W9BXR, W9CF, W9CFA, W9CGC, W9CGO, W9CKV, W9CNF, W9CXT, W9DKK, W9DNR, W9DOJ*, W9DOP, W9DOQ, W9DPL*, W9DPR, W9DWR, W9EDC, W9EFA, W9EMB, W9FDJ, W9FQY, W9FTT*, W9FTZ, W9FYX, W9GHH, W9LU, W9PO, VE1AR, VE3BO*, VE3CR, VE3JW, VE4BR, VE4CU, KA1HR, K6GJ, CM5CX, NJ2PA, NN1NIC**, HC1FG, OA4J, XE-ARN.

14,000-ke. band: W1ALA, W1ASF, W1AU, W1AUE, W1BJN, W1BKF, W1CMX**, W1DA*, W1MP, W2AIY, W2AJP, W2AMR, W2ASY, W2BDM, W2BHW, W2BJJ, W2BOR, W2BRV, W2BRY, W2BST, W2CCD, W2CJX, W2CVJ, W2KU, W2OA, W3AIU, W3AOH, W3ARX, W3CK, W3CKL, W3DC, W3QW, W3RA, W3ZG, W4AEF, W4AJB**, W4AJK, W4AL*, W4DE, W4GJ*, W4OZ*, W4RU, W4SJ, W4TL, W4UJ, W4VJ, W5AGG, W5BH, W5BHJ, W5OY, W6AJ, W6AOE, W6AVJ, W6BWK, W6DTE, W6EB, W6EUG, W6IH, W6UE**, W7AAZ, W7AGB, W7HX, W7VB, W7VC, W8AAU, W8AEH, W8AII, W8ALH, W8AMH, W8AQG**, W8AQZ, W8AQZ, W8AUT, W8AXN, W8BCT*, W8BCZ, W8BEA, W8BFZ, W8BGT, W8BJI, W8BTI, W8BV, W8BWM, W8BWU, W8CAQ, W8CF, W8CHP, W8CIY, W8CJT, W8COH, W8CUX, W8DCL, W8DHC***, W8DJV, W8DTS, W8DV, W8DYK, W8PH, W8PM, W8TI, W8VB, W8VK, W9AEW, W9AFN, W9AM, W9ANI*, W9APV, W9AS*, W9ATH, W9AXF, W9AZ, W9BAB*, W9BPL, W9BTT, W9BUO, W9BVV, W9BXA, W9CE*, W9CMV, W9CNQ, W9DDB, W9DEX, W9DJF*, W9DMW, W9DOQ,

W9DPB*, W9DQY, W9DVK, W9DYU, W9DZN, W9EFQ, W9ENR, W9ETA, W9EVE, W9FBV, W9FDJ*, W9FDQ, W9FIG, W9FQG, W9FTZ*, W9FUR*, W9FWF, W9FXJ*, W9FZM, W9FZO*, W9GHG, W9GHH**, W9JM, W9SL, CE5AA, CM2JM, CM8UF*, X235, K6BHL.

ELECTION NOTICES

To all A.R.R.L. Members residing in the Sections listed below:

(The list gives the Sections, closing date for receipt of nominating petitions for Section Manager, the name of the present incumbent and the date of expiration of his term of office.) This notice supersedes previous notices.

In cases where no valid nominating petitions have been received from A.R.R.L. members residing in the different Sections in response to our previous notices, the closing dates for receipt of nominating petitions are set ahead to the dates given herewith. In the absence of nominating petitions from Members of a Section, the present incumbent continues to hold his official position and carry on the work of the Section subject, of course, to the filing of proper nominating petitions and the holding of an election by ballot or as may be necessary. Petitions must be in Hartford on or before noon of the dates specified, all of which are 1930.

Section	Closing Date	Present SCM	Present Term of Office Ends
Nevada	May 15, 1930	C. B. Newcombe	Sept. 15, 1928
Virginia	May 15, 1930	J. F. Wohlford	Dec. 2, 1928
Alaska	June 15, 1930	W. B. Wilson	Mar. 28, 1930
Hawaii	June 15, 1930	F. L. Fullaway	Jan. 7, 1930
N. Y. C. & Long Island	May 15, 1930	M. B. Kahn	June 28, 1930
Utah-Wyoming	May 15, 1930	P. N. James (resigned)	Aug. 17, 1930
Western New York	May 15, 1930	.....	.....
So. N. J.	May 15, 1930	N. R. Weible (resigned)	Nov. 30, 1931
Illinois	June 15, 1930	F. J. Hinds	July 1, 1930
Western Mass.	June 15, 1930	J. A. Tessmer	"
New Hampshire	June 15, 1930	V. W. Hodge	"
Santa Clara Valley	June 15, 1930	F. J. Quement	"
Nebraska	June 15, 1930	C. B. Diehl	"
Wisconsin	June 15, 1930	C. N. Crapo	"
Western Pa.	June 15, 1930	A. W. McAuley	"
Missouri	June 15, 1930	L. B. Laizure	"
No. N. J.	June 15, 1930	A. G. Wester	July 12, 1930
So. Dak.	June 15, 1930	D. M. Pasek	July 12, 1930

Due to the resignation of Mr. Parley N. James, W6BAJ, in the Utah-Wyoming Section, and Mr. Norman R. Weible, W3BWJ, in the Southern New Jersey Section and the death of Mr. C. S. Taylor in the Western New York Section, nominating petitions are hereby solicited for the office of Section Communications Manager in these Sections and the closing date for receipt of nominations at A.R.R.L. Headquarters is herewith specified as noon, May 15, 1930. Reports from ORS in these sections should be sent to the Acting SCM listed on page 3 of QST.

CANADA

Nominating petitions for Section Managers in Canada should be addressed to Canadian General Manager, Alex Reid, 169 Logan Ave., St. Lambert, Quebec. To be valid, petitions must be filed with him on or before the closing dates named.

Saskatchewan May 15, 1930 W. J. Pickering Dec. 2, 1928
Maritime May 15, 1930

To all A.R.R.L. Members residing in the Sections listed:

1. You are hereby notified that an election for an A.R.R.L. Section Communications Manager, for the next two-year term of office is about to be held in each of these Sections in accordance with the provisions of By-laws, 5, 6, 7 and 8.

2. The elections will take place in the different Sections immediately after the closing date for receipt of nominating petitions as given opposite the different Sections. The Ballots mailed from Headquarters will list the names of all eligible candidates nominated for the position by A.R.R.L. members residing in the Sections concerned.

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W9FJX*.
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3. Nominating petitions from the Sections named are hereby solicited. Five or more A.R.R.L. members residing in any Section have the privilege of nominating any member of the League who holds an O.R.S. appointment in their Section as candidate for Section Manager. The following form for nomination is suggested:

(Place and date)

Communications Manager, A.R.R.L.

1711 Park St., Hartford, Conn.

We, the undersigned members of the A.R.R.L. residing in the Section of the Division hereby nominate as candidate for Section Communications Manager for this Section for the next two-year term of office.

(Five or more signatures of A.R.R.L. members are required.)

At this writing elections are in progress in the North Dakota and Northern Texas Sections.

The candidate and five or more signers must be League members in good standing and the candidate must be the qualified holder of a Communications Department, Official Relay Station appointment or the petition will be thrown out as invalid. The complete name, address, and station call of the candidate should be included. All such petitions must

be filed at the headquarters office of the League in Hartford, Conn., by noon of the closing date given for receipt of nominating petitions. There is no limit on the number of petitions that may be filed, but no member shall sign more than one such petition.

4. Members are urged to take initiative immediately, filing petitions for the officials for each Section listed above. This is your opportunity to put the man of your choice in office to carry on the work of the organization in your Section.

— F. E. Handy, Communications Manager.

ELECTION RESULTS

A valid petition nominating a single candidate as Section Manager was filed in Tennessee before the closing date that had been announced for receipt of such petitions. As provided by our Constitution and by-laws, when but one candidate is named this candidate shall be declared elected. Accordingly, an election certificate has been mailed to the following official:

Tennessee James B. Witt, W4SP Mar. 20, 1930
832 N. Fifth Ave.
Knoxville, Tenn.

DIVISIONAL REPORTS

ATLANTIC DIVISION

MARYLAND-DELAWARE-DISTRICT OF COLUMBIA — SCM, Forrest Calhoun, W3BBW — Things took a drop this month. I guess we are getting into the spring fever period. Hi. I have room for more ORS and will gladly appoint any reliable stations. Will some of you fellows who have a real means of checking frequency get in touch with me in regards to Official Observer appointment? Maryland: W3CGC says early a.m. skeds are FB. W3LA took a big drop this time. Hi. W3BBW is trying 3500-ke. fone. W3AFF nearly went wrong by sending his report to the wrong address. W3GF is helping W3DC rebuild. W3AOO, a new ORS, reported via radio. W3AJR is QRMd by school work. W3AHL reported. W3DG is experimenting with 14-mc. fone. W3NY is trying out his new 204A and also a MOPA on low power. Delaware: Hurrah, at last another report from the last state. Hi. That makes three reporters in Delaware. Will the rest please follow suit? W3ALQ wants to know if something can be done to widen the 3500-ke. fone band. Yes, OM, to the receiver. Hi. He also reports a new station, W3ABB, at Seaford. W3AJH found too much QRM on 7000 kc., so went down on 14,000 kc. W3HC, our newcomer, reports nothing unusual. District of Columbia: Our RM, W3BWT, again resumes the head of our house with a very nice total. W3BF is having a hard time with his new xtal on 3580 kc. W3OZ has some nice skeds. W3CAB went away, but didn't fail to report. FB, OM. W3PM was only on part time, but had a nice total. W3CDQ has a new 14,000-ke. xmitter. W3ACW came to life at last. W3AKR was busy with school. W3NR is also back on the air again. The SCM had the pleasure of seeing the motion pictures of the Army Arctic flight, and they are FB. Our section is sure going FB now. More reports next time, please!

Traffic: W3BWT 441, W3BF 105, W3CGC 105, W3OZ 82, W3LA 79, W3BBW 66, W3CAB 38, W3AFF 22, W3PM 19, W3CDQ 16, W3ALQ 8, W3GF 8, W3ACW 7, W3AJH 4, W3AOO 4, W3AJR 3, W3AHL 2, W3AKR 2, W3HC 1.

SOUTHERN NEW JERSEY — SCM, N. R. Weible, W3BWJ — The old reliable stations in this section continue to roll up good totals. W3DH surely made a good showing for two weeks' traffic handling. W3ASG shows what a one-man station can do about moving traffic. W3UT has been on the air every day this year. W3ATJ finds plenty of traffic on 14 mc. W3BWJ is operating on 3.5 mc.

Traffic: W3DH 83, W3ASG 73, W3UT 27, W3ATJ 17, W3BWJ 12.

EASTERN PENNSYLVANIA — SCM, Don L. Lusk, W3ZF — Several new stations reported this month. We wish to welcome you, fellows, and also announce that your reports are appreciated. W3MC is doing some mighty fine Official Observing work. WSAWO has been off the air almost

a full month because of QRM to BCLS. W3NF is in school in Philadelphia, but has W3AMR operating his station. W3QP reports an awful bunch of new hams. W8VD reports Army-Amateur activity. The SCM received a very nice letter from W3TB. W8DHT had a slight attack of spring fever. W3AUR reported. W8BIR of the Central High School, Scranton, has been built by W8AWO. W3CDS received only four replies to those thirty cards he sent out asking for schedules. W3FY, a new man, just joined the League. W3BQ reported heavy school QRM. W3UH, a brand-new ham, reports his 3500-ke. outfit going strong. W3UX doesn't believe he can quite make the grade for an ORS certificate. Keep trying, OM! W3ZF has been experimenting with a 14-mc. 'phone rig. W3JZ, the old Conn. Yankee, visited W3ZF. Let's not forget our duty to the League and ham radio, fellows! Send in those Official Observer reports!

Traffic: W3NF 225, W3ZF 187, W8DHT 13, W3TB 46, W8VD 26, W3QP 42, W3AUR 14, W8BIR 4, W3FY 30, W3UH 38, W3BQ 22, W3UX 28.

WESTERN PENNSYLVANIA — SCM, A. W. McAuly, W8CEO — W8YA, with ten schedules, leads the section this month. W8DLG, also with ten schedules, takes second place. W8CMP is still very active. W8CEO is taking on a schedule with W1MK. W8CFR will be home from Brazil by the time this appears in print. W8CNZ will be off the air until fall. W8DUT has a new receiver. W8AJE and W8BRJ are building new monitors. W8CPE is a new ham in Springdale. W8DKS writes up a report for Uniontown and recommends W8BZE for ORS. W8BGW is QRL with set repairing. W8GI took his wife to the hospital. W8CLQ is now in Erie. W8APQ sends in a bunch of good signals and also some sinful ones. W8BWL wants an ORS appointment. W8CQA reports "all quiet here." W8AYH received cards from England and Germany. W8CLR and W8CLS are new hams in McDonald. W8ASE relayed an urgent message for Buffalo. The fellow who is using the call W8DSB on 'phone on 3710 kc. had better "lay off." The real W8DSB has not operated for some time but still holds the license. Some of these call bootleggers are going to find themselves in trouble clear up to their neck before long. The A.T.A. is planning another banquet in April.

Traffic: W8YA 688, W8DLG 158, W8CMP 45, W8AAG 34, W8CEO 27, W8CUG 20, W8CNZ 16, W8DUT 14, W8DKS 6, W8AJE 4, W8APQ 27, W8CQA 15, W8AYH 3, W8ASE 2, W8BZE 28.

WESTERN NEW YORK — Acting SCM, J. Miller, W8AFM-W8CTK — The sudden death of Charles S. Taylor, W8PJ, our SCM, came as a great shock to the Western New York Section and especially the Radio Association of Western New York. His long and faithful service as SCM and Secretary-Treasurer of RAWNY will not be forgotten. W8AFM is now an ORS, OBS and OO. W8APD is on 7 mc. with a 210. W8ALY is chief operator at WHAM.

QST FOR MAY, 1930

VII

WSBAV was at the Cleveland Whoopie Party. WSAVM worked VK on 7 mc. WSBIF is bothered by BCLs. WSNW is on 14 mc. for DX. WSBHK is on 14, 7 and 3.5 mc. WSBJO wants an ORS. WSBPL says lots of DX, no QRM on 14 mc. WSBMJ will be on with 150 watts soon on 3.5-mc. band. WSBUP is on 14 mc. and working DX. WSCCM says he has spring fever. WSCDB reports he will have WSCO on an airplane from Empire Airport soon. WSCPC is in California at present, but will be acting SCM when he returns, until an official election can be held. WSCSW wants an ORS. WSCG will be on soon with xtal. WSCYG is a B.C. operator at W1BX. WSDII is working skeds on 7-mc. band. WSADE is now secretary of Radio Association of Western New York, and Connette of WSAFM is treasurer. WSDQP has some good skeds on 3940 kc. WSOA is working some good skeds on 4000 kc. WSTZ asks for an ORS. WSDSA is at Saranac Lake for his health. WSDYI is out after an ORS. WSDME reports four prospective hams in Auburn. WSCVJ has been working DX.

Traffic: WSBHK 55, WSBJO 117, WSBPL 72, WSBMJ 51, WSBUP 6, WSCCM 147, WSCDB 27, WSCSW 23, WSCYG 31, WSDII 50, WSDQD 205, WSDSA 19, WSOA 96, WSTZ 30, WSDME 21, WSDYI 29.

CENTRAL DIVISION

INDIANA — SCM, D. J. Angus, W9CYQ — W9FHM, the new U.S.N.R. transmitter for Section 3, Ninth Naval District, located at Indianapolis, operates on a frequency of 3750-ke. crystal-controlled. U.S.N.R. communication units have been formed at Seymour, Indianapolis, Fort Wayne, Valparaiso and Marion, and regular schedules are being maintained. For information, write Lt. Comdr. D. J. Angus, P. O. Box 596, Indianapolis. W9EPH is building an entirely new high-power transmitter. W9BZZ has a new transmitter going on 14,000 kc. W9CMQ is again among the living on 7000 kc. W9FKE is building a new fone station. W9EPH wants schedules on 7169 kc. at midnight, CST. W9EWQ is looking for a new plate transformer. W9EYY is putting in a new plate supply. W9FKE, W9CMQ and W9BZZ are assisting in the installation of a new police radio transmitter at Richmond. W9GJS has blossomed out with a new wavemeter. W9ERP is another new ham at Bloomington. W9EY is running a radio school at the Rushville High School; W9AHH and W9BDT are building a portable transmitter. W9BKJ has a new antenna. W9EKA, W9ETH, and W9EV are new stations at Fort Wayne. W9AXI is putting up a 3500-ke. zepp. W9AMZ moved his transmitter to his shop. W9DWL has changed over to push-pull. W9AAI is putting a xtal fone rig on the air. W9CVX bought a Vibroplex and now sounds like an automatic. The Fort Wayne Radio Club has organized a vigilance committee. They also have secured club rooms at the National Guard Armory. W9RW has a new 14-mc. transmitter. W9AIP is experimenting with low power. W9ENX is at Valparaiso Radio School. W9DZX is now using a pair of 210s xtal controlled. W9FBH is opening up with a 210 on 7000 kc. W9DDB wants to connect with any hams that are going to Purdue next year. QRA-Delta Alpha Pi Frat. W9UM leads the state in traffic with W9DDB second.

Traffic: W9UM 128, W9DDB 102, W9AIP 15, W9RW 7, W9AKJ 32, W9BKJ 27, W9AHH 1, W9GJ 26, W9CHC 26, W9FYB 5, W9GCO 21, W9EPH 10, W9CMQ 12, W9FXO 5, W9FKE 12, W9FXM 3, W9GJS 29, W9DSC 15, W9CYQ 11, W9FHM 28.

WISCONSIN — SCM, C. N. Crapo, W9VD — W9DJK gets into the BPL again this month. W9EBO has a fine total. W9BWZ is a member of the 65th Cavalry net. W9DTK finally has the crystal oscillating. W9FAW worked three K6's and then burned up his plate transformer. W9FSS wants more schedules for Monday night Army net on 3500 kc. W9AZN is grinding his own crystals. W9ESZ has installed rectobulbs. W9ASL is still on the air. W9VD has finished his tuned screen-grid receiver. W9CVI is using single wire feed as per W8GZ.

Traffic: W9DJK 183, W9EBO 80, W9BWZ 44, W9DTK 34, W9FAW 33, W9FSS 28, W9AZN 17, W9ESZ 8, W9ASL 7, W9VD 5, W9CVI 1.

OHIO — SCM, H. C. Storek, W8BYN — Already the seasonal trend towards low totals is showing itself, but we will have to admit that MORE of you are active than heretofore, and the percentage keeps up. Did you notice how Ohio stood in last QST? FB! Let's keep it that way. Only one in the BPL this time and that's the XYL. W8CNO thinks some of you have been unjust and says to tell you that it is not the amount of time spent on the air that counts but

the WAY you use what time you have. W8CMB reports that he lost his 852 and 204A. W8NP keeps a flock of schedules. W8CRI is off the air temporarily. W8BAC's new QRA is Rocky River, Ohio. W8CFT has been DXing. W8GZ says discontinuance of AA work during international tests lower his total. W9GKI is now located in Columbus. W8BDU has been building a new receiver. W8CIY has been doing his bit. W8ADS is doing good work as OO. W8BBR is still laid up in bed. W8RN is back again. W8BEA says he is teaching his dog to chase QRM. Hi. W8BKM just got his amateur extra first license. W8AQ had change of schedule in work and has not had much time on the air. W8ADU again kicks in with some traffic. W8CSS had tough luck with receivers. W8TK uses B battery supply. W8CX did quite a bit of DX during the tests. W8HH says traffic picked up fine towards the end of the month. W8ATL reports he is ready for traffic on 7000 after 7 p.m. E.S.T. W8AKO is working at WRBH. W8ARW has been on the road. W8BYN built another screen-grid receiver. W8APC has been having tough luck working skeds with his low power. W8OQ has rebuilt. W8EJ has a 250-watter going on 3750 kc. W8PL has a new xtal set and new receiver. W8CFL and the SCM were going to get the old Ohio "vicious circle" of some years back going again, but so far the SCM has not been on the air much. W8EZ has left this section for a while and is working at WFBL. W8IF will have new stations at Curtice and Milbury. W8DIH reports rebuilding at his place and W8DDQ. The gang of the Norwalk Amateur Radio Association have some mighty fine ideas about officers they are trying out. W8LI reports that some one stole his battery charger. W8DBK is all rebuilt. He says their club will have W8CMR going soon. W8BZL has not been able to do much with traffic. Well, gang, keep up the good work, and don't drop out now that QRM QRM is starting his racket again.

Traffic: W8CNO 353, W8CMB 117, W8BYN 114, W8NP 99, W8CRI 84, W8BAC 72, W8CFT 56, W8GZ 49, W8BDU 44, W8CIY 36, W8DVL 31, W8ADS 26, W8BBR 25, W8RN 25, W8BEA 24, W8BKM 23, W8AQ 21, W8ADU 20, W8CSS 19, W8TK 19, W8CX 18, W8HH 17, W8ATL 14, W8ARW 12, W8APC 8, W8OQ 6, W8EJ 5, W8PL2, W8CFL 4, W8EZ 4, W8IF 3, W8DIH 3, W8DDQ 2, W8LI 2.

KENTUCKY — SCM, J. B. Wathen, III, W9BAZ — Fellows, you have made history. ORS reported 100%, also a goodly number of hopefuls. Check up another round for W9AZY. Once more and the Red Eye is his. W9ARU says the winner of that prize will get quite a kick out of it. After giving a tungar bulb the "flash test," W9BAN bought a dry charger. W9OX labored and brought forth another prodigy, W9EQO. W9ENR continues to increase his DX totals. W9AUH and W9ELL have 14-mc. fones. W9CEE is the only reporter in Ashland. W9FZV snagged a commercial ticket. W9GGB an extra first. W9DDQ applied for an ORS. W9BXK is chief constructor for W9FOB. W9EYW's tummy is on the blink again. W9BWJ reports that W9BKU has opened up in Paintsville. W9ABG is looking for "Tishie." QRA? W9ZZE, on location, is doing scurpiously. W9AIN will soon be in new QRA. Why not try 3.5 mc., W9FQN? W9BGA gets foreign traffic. W9FKM is doing much better in new location. W9BAZ had a fine time in New Orleans at Mardi Gras until the U.S.S. Texas docked and cut down the YL supply.

Traffic: W9AZY 97, W9OX 82, W9ELL 22, W9ENR 22, W9JL 19, W9AUH 15, W9FKM 15, W9FZV 13, W9BAN 11, W9DDQ 11, W9AJY 9, W9BAZ 7, W9BXK 5, W9CEE 5, W9ZZE 5, W9BGA 4, W9FQN 4, W9AIN 3, W9EYW 3, W9ABG 2, W9GGB 1.

MICHIGAN — SCM, Dallas Wise, W8CEP — W8AZ is now using a WE2II with 850 volts of storage Bs. W8ASO has just returned from a trip through the East, where he visited W1MK and the gang at headquarters. W8BBX handled a nice bunch of traffic with a 245 in a Hi C Hartley. W8DED was quite busy during the International Tests. W8BV is selling out. W8AEQ has been doing some fine traffic work. W8CKZ likes his 852 first rate. W9EQV has been having quite a bit of company lately. W8AUB is working with a television outfit. W8BUH has the boys in traffic this month. W8ACB has just finished an MOPA set. W8CU has been QSO four continents and fourteen countries. W8PP has been on 14,000 kc. W8AUT has tried all kinds of antennas but has gone back to the voltage fed Hertz. W8MIV and W8AZD attended the All-S Whoopie Party at

Cleveland, March 15th. W8BRO expects to operate on the lakes this summer. W9CE is installing rectobulbs. The gang at WYE-W8SL have a fine outfit out there now. W8DMS, W8DYH and W8CEP paid them a visit recently. W9GJX is back home again after her extended trip to Detroit, Canada, Ohio, etc. W8DSF expects to have a new receiver soon. W8CUX's pusher-out now consists of a 204A. W8DYH is looking for schedules at 30 WPM or more. W8MA, the Univ. of Detroit station, has been doing some experimental work on 28mc. Walt of W8BRS now has a bug, and can almost send continental with it. Believe the gang will all be glad to know that Walt is getting so he can get around on his feet a little. W8CPB has a WE2IID in a TPTG. W8DDO has an AC short wave receiver now. W8WO is still on 14,000 kc. W8RD's 14,000-kc. fone seems to be perking FB. W8CAT has been going great with his new xtal outfit. W8COW is perking great as usual.

Traffic: W8WO 4, W8AZ 21, W8BBX 63, W8DED 12, W8AEQ 150, W8CKZ 27, W9EQV 13, W8AUB 2, W8BUH 2, W9EGF 25, W9AXE 26, W8JD 154, W8CU 14, W8PP 23, W8AUT 14, W8MV-W8AZD 21, W8BRO 115, W9CE 12, WYE 70, W8DMS 22, W9GJX 3, W8DYH 67, W8MA 6, W8BRS 57, W8CPB 5, W8DDO 13, W8CAT 90, W8CEP 9.

ILLINOIS — SCM, F. J. Hinds, W9APY — We will soon have a clean-up on dead ORS. Get busy, fellows, and send in reports. W9BNR is helping a new ham get started. W9BSH did good work in the Sweepstakes. DX is still good at W9BRX. W9BZL is trying to get a Navy Unit started in his town. W9CKZ worked W9ZZG and took traffic. (W9GGZ is W9GZ on a trip in Pacific). Traffic is increasing at W9FCW. Schedules are wanted at W9BVP and W9CKZ. W9DGK was QSO W5PA and handled a lot of Food Show traffic from Enid, Okla. W9AEF is experimenting with audio amplifiers and speech public address systems. Xtal experimentation is going on at W9ERU. W9ETP has moved QRA's. W9CDC is the new portable call of W9ERU. W9FDJ says DX is fine. W9GIV says they have a new slogan for the station, "The Voice from the Coal Bin and NOT Black." Hi. The ops at W9BMQ are busy with graduation plans. The BCLs are after W9KA. A crystal portable outfit will be soon on the air at W9BZO. W9FVO is on 7 and 3.5 mc. W9ALK will soon move to the west coast. W9LL is an O.O. W9CKM is knocking 'em dead with traffic. W9BJA and W9CKM are trying to beat the Air Mail to California. W9AGQ has crystal control on 7015 and 14,036 kc. W9FPN is planning a 3.5-mc. outfit. W9AFN says there are about twenty stations active within a half mile radius of his place. Hi. W9AKA has a new Super-Wasp. W9CRR is grinding a crystal for 3550 kc. W9BHW reports he has worn the seat out of his trousers pounding this month. W8DSS is refraining from blowing any more condensers. W9ANQ will take up special school work soon. A new 210 is working hard at W9ASY. W9TC has moved to a better location in the telephone building in Chicago. W9DWA is trying low power. DC is very fine at W9DWA. W9BDW is coming down to 3.5 mc. W9GJJ is out for more traffic. W9AHK is working hard with Army network. W9PA is at work on his AC receiver. W9CZL reports things going along fine.

Traffic: W9CKM 238, W9AHK 95, W9ANQ 90, W9BZL 51, W9FCW 49, W9AD 43, W9DZM 32, W9BHW 30, W9DGK 30, W9CZL 29, W9DSS 26, W9AFN 23, W9BVP 22, W9ALK 20, W9APY 18, W9CKZ 17, W9DOX 17, W9AKA 15, W9PA 14, W9GIV 13, W9BSH 11, W9BZO 11, W9ASY 10, W9BNR 10, W9KB 10, W9ERU 9, W9CRR 8, W9LL 8, W9DWA 7, W9AGQ 6, W9BDW 6, W9CUH 6, W9KA 6, W9FDJ 5, W9BMQ 4, W9BRX 3, W9GJJ 3, W9ACU 2, W9FO 2, W9FPN 2, W9FVO 2, W9FOV 1.

DAKOTA DIVISION

NORTH DAKOTA — SCM, B. S. Warner, W9DYV — W9BVF takes the lead this month. W9DGS reports that he earned nine points in the contest. W9FCA reports two new hams in his town. W9DYA is still down in Minnesota. W9DFG expects an Easter visit from W9GGQ. W9DM reports that his radio class in high school is going well. W9AAN still keeps the fone going.

Traffic: W9BVF 500, W9DGS 203, W9FCA 73, W9DFG 39, W9DM 20, W9AAN 7.

NORTHERN MINNESOTA — SCM, C. L. Jabs, W9BVH — W9CTW leads the section with a nice total and makes the BPL. W9EGU, our director, had to cancel his skeds due to other business. W9EGN is installing a short

wave trans-receiver in his airplane. W9GGQ visited Duluth. W9DOQ is moving to Virginia. W9AH says his Ford perks FB. W9CKI is back on the air with a 210. W9EHI has trouble with his antenna. W9CIY inherited four 852's. W9BCT has a commercial license and operates at WRHM. W9FFL is a new station at Duluth. W9BBL (St. Paul) is installing an 852. Activity at W9BVH is almost nil due to an injury to his left hand. He operated on 28 mc. recently, and had a very nice QSO with W6BAX. Why not use this band more, fellows?

Traffic: W9CTW 208, W9EGU 55, W9EGN 48, W9GGQ 28, W9DOQ 27, W9AH 22, W9CKI 22, W9CIY 7, W9BCT 5, W9BVH 14, W9BBL 3, W9FFL 5, W9EHI 13.

SOUTHERN MINNESOTA — SCM, J. C. Pehoushek, W9EFK — Did you notice that So. Minn. was the third highest in the country last month with a total of 15 ORS, the two leaders each having over 50? That's FB, gang. W9COS leads the section for the sixth straight time, making the BPL each time. W9BN makes the BPL for their fifth consecutive month. W9BN has xmitters on three bands, is on twenty-four hours a day, has skeds all over the country and makes an excellent clearing house for traffic. If anyone in the U. S. A. wants such a contact, write W9BN, and they guarantee to accommodate. W9YC made a large number of points in the February contest. W9DRG is our third station in the BPL. W9BNN gets fine reports during the day, but nil at night. W9BNF at Luverne is going strong. W9BKX can always be relied on for about fifty. W9GHO has xmitter capable of operation on all bands but 1715 kc. W9DGE has been traveling again. W9AIR has been spending a lot of time on his 00 work. W9DBC has been on 3.5 mc. with low-power fone. W9BTW-W9ELA have their xtal job going. W9BXE at Fort Snelling has two fifties in push-pull. W9DHP says W9CTO, W9DHI, W9BFI and W9DSH all copied commercial tickets recently. W9EYL claims spring fever. W9FCD has a new receiver. W9BQF says busy there. W9EFK finds the chain store razz helps business, but not collections. W9GGA has been laid up. W9DMA and W9FLE report as usual. W9CKU DX's once in a while. W9KI is seen around town. W9BVH is just getting going at Owatonna. W9CPM is on again after a year's absence.

Traffic: W9COS 882, W9BN 477, W9DRG 201, W9YC 130, W9BNF 60, W9BKX 43, W9GHO 31, W9BNN 96, W9DGE 30, W9AIR 29, W9DBC 12, W9BTW-W9ELA 12, W9BXE 22, W9DHP 6, W9EYL 4, W9FCD 2, W9BQF 2, W9EFK 1.

SOUTH DAKOTA — SCM, D. M. Pasek, W9DGR — W9DNS is consistently on top in traffic by means of his schedule with W9BN. W9DNS has a second op now in the person of XW9BQV, who is working in the Federal office with Nick Jensen, W9ID. Nick reports that 13 fellows took the exam when the R. I. was in Sioux Falls. He also reports that the Sioux Falls Radio Club is meeting every Thursday evening in W9DNS's barn. W9DRB is temporarily in the hospital letting a surgeon do the "oping." W9NM has a new monitor. W9DB has his 3500-kc. xmitter remotely controlled. W9CIR is on 3500 kc. regularly. W9DGR manages to keep his AA skeds.

Traffic: W9DNS 112, W9NM 23, W9DB 12, W9DGR 3.

DELTA DIVISION

ARKANSAS — SCM, Henry E. Velte, W5ABI — Fellows, meet our two new ORS, W. F. Fortune, W5LV of Dermott, and M. P. Mims, W5BDB of Texarkana. W5LV uses a pair of 210 tubes in a MOPA hook-up. W5BDB uses a pair of 410 tubes in TPTG and hi C hartley circuits. W5ALY is on 14 mc. looking for DX. W5ADJ has moved to Okla. W5AQX sends in his traffic report through W5IQ. W5IQ is the owner of a broadcast license and is operator at KLRA. W5AY and W5BKX are two new stations in Little Rock. W5ER is on 3500-kc. fone. W5HN was QSO K4AAN and VE4BB. W5LK reports being heard in Arizona on fone using a 112A. W5BLG is experimenting with his TPTG xmitter. W5BLV is getting out nicely with an MOPA xmitter. W5BDD is the proud owner of a pair of rectobulbs. W5PX is still operating at KGHF. W5BCN expects to be on soon with a pair of 210s. W5ABI, the SCM, will be very glad to QSO any of the gang. All reports should be mailed to me on the 16th of each month.

Traffic: W5ABI 41, W5AQX 22, W5BDB 6.

LOUISIANA — SCM, Frank Watts, Jr., W5WF — We need a report from every ORS and every non-ORS each month to aid in building up a real live section. W5YW leads the gang in traffic this month. W5BDJ is now on with a

201A in MOPA. W5ANA is asking for skeds. W5ZV is a new YL op in New Orleans. W5BAY is QRL at school. W5ANQ reports by radio. W5BJA will soon be on with an 852. W5ZT is a new station in Shreveport. W5EB visited the second op at W5WF. W5WF's first op is QRL with telegraph work. Now come on, fellows, let's have more reports.

Traffic: W5YW 121, W5WF 108, W5ANQ 106, W5ANA 53, W5BJA 47, W5BDJ 10, W5EB 10.

MISSISSIPPI — SCM, J. W. Gullett, W5AKP — W5BBX is wild about the YLs, so his transmitter is getting a rest. W5AWP is using 'phone exclusively to handle his traffic in the 3500-ke. band, and is now an Associate Member of the I.R.E. W5AAP has a daily schedule with the SCM. W5AZV reports that the Jackson *Daily News* gave the amateurs of Jackson a good write up on March 16th. W5BHL has a schedule with the SCM every Sunday. W5AOM applied for an ORS. W5QQ had his ORS certificate cancelled on account of failure to report. W5GQ is working foreigners right along. W5ANP has a schedule with W5AAP. W5AED is going to try for a commercial license. W5AKP has two Amrad "S" tubes on the way. The SCM would like to have reports from W5TX, W5ANP, W5MI, W5BEV, W5ALZ and W5APO. Anyone desiring an ORS should get in touch with the SCM.

Traffic: W5AKP 129, W5AOM 91, W5AAP 62, W5AZV 44, W5AWP 15, W5BHL 2.

TENNESSEE — SCM, James B. Witt, W4SP — A lot of you fellows who have been sending in reports failed to get them in this month. Let's not let up, just because warmer weather is here. W4VK is going to replace his chemical rectifier with 281's. W4HE is moving to N. Y. to take a position with Bell Laboratories. W4CW is putting in a 3500-ke. fone. W4RP has been having trouble with skeds. W4AFS says the Army-Amateur Net is working fine.

Traffic: W4RP 128, W4VK 38, W4FR 31, W4AFS 30, W4RO 21, W4CW 8, W4SP 9.

HUDSON DIVISION

EASTERN NEW YORK — SCM, H. J. Rosenthal, W2QU — The Schenectady Amateur Radio Association with 40 enrolled members has been started, and the Pioneer Radio Club of Westchester County is on the air with a 1/4-kw. transmitter with the call W2ANS. The club members had a treat recently, when Reinartz gave a description of his trip on WNP. W2LU continues to keep traffic moving. W2QU and W2BUW are spending two weeks of active service with the Naval Reserve. W2QN is using 'phone on 14,000 ke. and has worked France and Brazil. W2ALI reports that all the new hams in Poughkeepsie are using 'phone. W2CUF has induced the Dept. of Commerce to give him a two-letter call, and will henceforth be known as W2BC. W2BAI is building a new crystal outfit. W2BKN compromised with the OW by listening all the time to the BCL set instead of the short-wave receiver. W2UO reports very little traffic. W2AYK is unable to give much time to traffic work. W2ACY reports plenty of DX. Several freshmen at W2SZ are making an active station out of it. W2BJA was very much pleased to hear W1AOF operating FQPM in West Africa. W2ACB is overhauling his transmitter. W2ANV reports very much increased Army-Amateur activity in the district with W2PX as the latest addition to the A-A stations. NDB is now making QSOs with Naval Reserve stations in this section, and there is a general increase of interest in the work. All amateurs interested in joining the Naval Reserve should get in touch with W2QU.

Traffic: W2QU 415, W2LU 330, W2QN 49, W2ALI 42, W2ANV 41, W2CUF 27, W2ACB 27, W2BAI 22, W2BJA 19, W2BUW 13, W2SZ 8, W2ACY 8, W2AYK 7, W2UP 4.

NEW YORK CITY AND LONG ISLAND — Acting SCM, V. T. Kenney, W2BGO — The gang over the river has been putting it over on us for two consecutive months now. We cannot get the traffic banner that way. There are going to be cancellations if some of the ORS don't report more regularly. Manhattan: W2SC makes the BPL for the third consecutive month, leading the Section. W2AFO is doing plenty of OO work. W2BBY claims traffic is getting better. W2BCB QSO'd G5BY. W2BDJ helps to keep W2BW1, 27th Special Troops' Station, on the air. W2BXW, a future ORS, wants skeds. W2OV is kicking about the CQ bounds. W2BNL is spending most of his time with the NBC. W2H J. C.C. of N. Y., recently worked three new countries. W2AVK can now be heard on 14-mc. fone. W2APS is breaking in a new op. W2AOY spends his time listening to

the gang all over the world. Bronx: W2BGO leads the Bronx. W2CYX is moving traffic on 14 mc. W2AQQ was darn near burned out, a fire getting to the xmitter. W2AET has a good wallop in these parts. W2BPQ, NCS for the Southern N. Y. State Net, 2nd Corps Area, keeps five skeds a week. W2AII is still battling with his antenna. W2VG, a new ORS, has rebuilt his receiver. W2AJJ, DeWitt Clinton H. S., has changed QRA from Manhattan to the Bronx. Brooklyn: W2ARQ, a new ORS, tops W2PF by one message and leads the Brooklyn gang. W2PF, Radio Aide, 2nd Corps Area, reports off-wave operation on 3.5 mc. as well as 7 mc., and asks the gang to please keep the Army band free from QRM on Monday nights. W2CCD is still mixing law studies with traffic. W2APK, another new ORS, is increasing his total every month. W2BIV is soon to follow Doc Walsh's footsteps in the dental profession. Long Island: Once more W2AVP makes the BPL on deliveries. W2BNX's ops are separated, Bill being chief op at W3AOW at U. of Pa. W2AYM-W2ATT, the Boy Scout Station, is having trouble with BCLs. This month's cancellations are W2AEU and W2AVR.

Traffic: Manhattan: W2SC 235, W2AFO 28, W2BBY 23, W2BCB 17, W2BDJ 16, W2BXW 10, W2OV 8, W2BNL 4, W2HJ 3, W2AVK3, W2APS 3. Bronx: W2BGO 140, W2CYX 61, W2AQQ 21, W2AET 8, W2BPQ 9, W2AII 8, W2VG 6. Long Island: W2AVP 127, W2BNX 12, W2AYM 9. Brooklyn: W2ARQ 53, W2PF 52, W2CCD 25, W2APK 24, W2BIV 20.

NORTHERN NEW JERSEY — SCM, A. G. Wester, W2WR — It is with regret that we announce the resignation of W2CP, our RM. Heavy business pressure necessitated the close of his station. Will a few of the ORS please drop the SCM a line if they are interested in holding down the job of RM? W2WR would like some early morning skeds on 7 mc. W2JF jumps into the BPL again. W2AOS reports Army skeds back to normal. W2APU has rebuilt his xmitter. W2CWK noticed a big drop-off in signal strength with the last full moon. W2BME, W2BJS and W2BAU keep things humming in Highland Park on 3.5 mc. W2ANG was deserted by his YL, so is now back on the air. W2BY is also back on 14 mc. W2BZB, a new ham, makes an initial report. W2BYP applied for an ORS. W2CW sends in a report after months of silence. W2AGX says the BCLs near him have plenty of patience. W2API has been assigned the new call of W2ZC and has 1000 watts on the air. W2AUP blew out his filter condensers. W2AI worked a few more countries to bring his total of countries worked to 50. W2CXL's traffic figure is lower this month, as they were off the air during the International Tests. W2DV has installed an xtal. W2AVO expects to have a 3500 ke. fone shortly.

Traffic: W2WR 12, W2JF 116, W2AOS 21, W2APU 2, W2CWK 125, W2JC 19, W2ANG 3, W2CJX 48, W2BYP 11, W2CW 3, W2AGX 7, W2AUP 10, W2AI 27, W2DV 39, W2AVO 32, W2CXL 315.

MIDWEST DIVISION

IOWA — SCM, H. W. Kerr, W9DZW — And here is more proof that skeds help traffic — W9EJQ turns in a total of 503! W9EDW is again heard on 7000. W9DUU gets in his first report. W9ASM is back with us. W9BCA holds his NN-CAB skeds. W9EFU is a new reporter. W9EOP gets into the ORS list. W9DNZ has a new MG. Don't shoot any high power W9EIW's way. She has a 2400-egg incubator going. W9DXP is rebuilding to 4-stage — 210, 210, WE50 and UX860. W9GKL can't refrain from reporting whether he has traffic or not. W9FWG is boosting totals now on 3850 and 7250 kc. W9GCP has xtal working on 3500 and 7000-ke bands. W9CK is back with xtal control. W9APM is still having fun with AC receivers. W9AVV is a new ham at Morning Sun. W9DPL beats his former records on traffic. W9ACL and W9FUD are putting Davenport on the map. W9ELV dropped a 50-watter. Oh, Oh! W9FZO finds someone is using his call. W9BCL has a new single wire feeder that does not QRM. W9EHX, W9AEW, W9FLK, W9CZC and W9CKD report through the Tri-State Club. And now let us say "C U in Ames, May 9th and 10th at the Short Course and Iowa Midwest Convention." Let nothing prevent your being at this convention!

Traffic: W9EJQ 503, W9DZW 107, W9FFD 81, W9FZO 78, W9DXP 68, W9ACL 60, W9FWG 59, W9EHX 58, W9BCA 50, W9ELV 45, W9AEW 37, W9FUD 30, W9DNZ 28, W9DPL 24, W9EIW 16, W9ASM 15, W9FDL 14, W9CZC 12, W9EOP 8, W9FLK 6, W9DUU 5, W9EFU 2, W9CKD 2.

NEBRASKA — SCM, C. B. Diehl, W9BYG — W9QY was on 14 mc. this month. W9EEW has been visiting in Chicago. W9DTH says DX is getting better all the time. W9DFR came out with a one KW bottle and is trying for 14-mc. fone. W9DVR has been very busy observing. W9EBF hams in between licks at KMMJ. W9FAM has had to slow down because of ill health. W9EHW is a new ORS on all bands. W9DI is busy with school and 14-mc. fone. W9BOQ breaks out again with a cool 160. W9BLW is very busy with A. T. & T. school. W9CHB is very busy with school, Cornhusker Radio Club and the "All-Lincoln Exposition." W9BBS had a hard time to eke out some traffic this time. W9CDB has new TPTG trying to push through that 44,000 high line QRM. W9BQR is very busy with his post office. W9DFF reports for the first time.

Traffic: W9QY 4, W9DTH 1, W9DFR 14, W9DVR 6, W9EBF 8, W9FAM 150, W9DI 7, W9BOQ 160, W9CHB 30, W9BBS 4, W9CDB 1, W9DFF 10.

KANSAS — SCM, J. H. Amis, W9CET — 3500-kc. fone has been taking the efforts of W9BTG. The RM of Eastern Kansas, W9FLG, is racking his brain over key click filters. W9DFY has a 14,000-kc. fone permit. A complete report of Dodge City activities is sent in by W9GJT, who would like reliable skeds on 7000 kc. The gang will be glad to learn that W9BQW secured a 100 watt B.C. permit using the call KGNO on 1210 kc. W9CKV is the proud holder of an amateur extra first. W9BRM has left the Daily Globe and has gone into B.C. selling game. W9BEZ has moved. W9CET has been trying out various kinds of receiving antennas. W9CFN put in rectobulbs. Moving to a new QRA has caused W9DEB to be off the air. A new ham is on in Topeka with the call W9EUX. W9FXY is making plans for bigger and better traffic totals. W9GFO is working lots of DX on 14,000 and 7000 kc. W9GHI reports R7 from VE1AK on 3500-kc. fone. W9HL is unable to keep skeds. W9ESL is going strong on fone. W9BWW reports a U.S.N.R. unit under way at the Nemaha Radio Club. W9BPL, the 0-0, reports 91 stations off-freq. in the 14,000-kc. band. The K.V.R.C. held a hamfest at the Topeka Chamber of Commerce, Sunday March 30th. Talks were given by W9RR, W9CFL, W9EUX and W9CET.

Traffic: W9BTG 125, W9FLG 74, W9DFY 57, W9GJT 43, W9CKV 14, W9BEZ 25, W9CFN 21, W9BWW 23, W9CET 16, W9FXY 14, W9GFO 12, W9GHI 10, W9HL 4, W9ESL 4, W9BQW 16.

MISSOURI — SCM, L. B. Laizure, W9RR — St. Louis area report: Traffic leaders this month are W9PW, W9DXY, W9FTA, W9BEU and W9EDK. W9AMR worked more DX this month. W9DSU has been absent lately because of YL QRM. W9EDK makes a plea for greater traffic activity in the section. W9FTA says he finally got rid of key clicks. W9DXY and wife visited that K.C. gang early in March. W9DZN is away again operating KFXI. W9BMU lacks only China to get WAC ticket. W9GHG says traffic nil on 14 mc. We regret to record the passing of W9GBT of Centerville this month, who was killed when he was accidentally struck by a 12-pound shot while watching fellow students in track meet work at the high school. W9DCD reported by radio. W9CJB reports for Festus neighborhood. W9FAL and W9EYB have school QRM. W9GJF is going strong on 7000 kc. W9EFR has been helping new hams get going. W9CDU says his skeds suffered when he started monkeying with 3500-kc. fone. W9BGN is on 7150 and 14,200 kc. W9ENF reports skeds FB. W9EUS is a new station in Joplin. W9CLQ finally got his xtal working. W9GCL had the misfortune to lose his wooden tower in a high wind. W9FYM says everything seems to combine to keep him from handling more traffic. Kansas City news: W9CFL, U.S.N.R. unit commander, has now put NDP on the air as 9th Naval District alternate control station on 4045 kc. W9BND has come back to life as W9CU. W9BMA handled a good total this month. W9DPA is anxious to handle traffic. W9GGI is a new K.C. station. W9AKZ lets the hams break into print occasionally by printing a ham column in local paper. He reports another new K.C. station, W9CSK. W9DQN has been having QRM from irregular hours at the W.U. The U.S.N.R. kept W9RR busy this month. W9CVT had a number of trans-Pacific contacts during March. W9ALC moved back to K.C.

Traffic: W9GHG 1, W9BMU 7, W9DZN 4, W9AMR 12, W9EDK 23, W9BEU 26, W9FTA 31, W9DXY 32, W9PW 49, W9CJB 24, W9EFR 16, W9CDU 21, W9BGN 37, W9ENF 11, W9GCL 30, W9FYM 2, W9DCD 22, W9AKZ 104, W9BMA 69, W9DPA 41, W9RR 29, W9CFL 239.

QST FOR MAY, 1930

NEW ENGLAND DIVISION

MAINE — SCM, G. C. Brown, W1AQL — The SCM would like to hear from any ORS that would be interested in serving as an Official Observer. There is a need of much work along this line. Director Best recently returned from fifteen days U.S.N.R. duty at the Boston Navy Yard. W1QH recently passed a very pleasant weekend with W1BIG, at Augusta. W1ATO is high man this month. Mrs. W1AJC comes second. W1AQD has been busy completely rebuilding his station. W1ANH says that rotten weather forced him to cancel three schedules. W1BFZ reports DX coming through again. We have a few newcomers in the game this month — Marden, W1AKO, of Veazie; Morrison, W1BLI, of Orono; Sutherland, W1AKR, of Brewer, and Morton, W1OT; and Sprague, W1UP, both of Bangor. John Mulanney, W1CJW of Bangor, has recently been elected to the Institute of Radio Engineers.

Traffic: W1ATO 163, Mrs. W1AJC 76, W1ANH 35, W1AJC 32, W1BFZ 23, W1AQL 24, W1QH 19, W1AQD 8, W1AHY 5.

EASTERN MASSACHUSETTS — SCM, Miles Weeks, W1WV — W1TL handled the largest total that has been turned in in this section for a long time. W1BKB now has his ORS certificate. W1RV is keeping some ship skeds with South America. W1LQ, W1BBT, W1ACA, W1AGS and W1WV have found the DX good on 14 mc. W1ASF besides piling up over 3100 points in the tests, worked all continents on March 8th in the space of 10½ hours. W1ZZ has been QSO ZL a number of times on 14 mc. around 0600 GMT. W1RW and W1ZZ also report being QSO PK. W1AZE, using two 210s scored over 1100 points in the International Relay Tests. W1KH is enjoying a short vacation in Bermuda. W1ACH is now using a single wire feeder Hertz antenna on 7000 kc. W1LM has been making changes in his power supply to improve his note. W1AAT is now an ORS. The 00s in this section are being kept altogether too busy. We commend them for doing their work well, but are sorry to note how many stations still fail to appreciate the seriousness of this off-wave business. Don't forget to mail those report postals promptly on the 16th.

Traffic: W1TL 417, W1BKB 267, W1RV 128, W1WV 92, W1AZE 85, W1ACH 73, W1LM 71, W1ASI 62, W1ANK 49, W1BKR 47, W1ACA 46, W1CRA 42, W1KH 29, W1AAT 27, W1LQ 18, W1AGS 18, W1WU 11, W1QZ 9, W1KY 6, W1BBT 4.

NEW HAMPSHIRE — SCM, V. W. Hodge, W1ATJ — W1IP has been trying to cure key clicks. W1APK sends in a photo of a very nice two panel 50-watt output 'phone transmitter. W1COW has had bad luck, blowing up his filter system and his filament transformer. W1AUH has been remodeling his fone outfit. W1YT is back on the air using the call W1ET. W1BMS, W1CTB and W1AOC are operators there. W1UN reported by radio. W1CNR of Meredith and W1COW of Exeter are new ORS. W1AEF is on whenever he can spare the time. W1AFD is back on 3500 after spending the winter on 7000 and 14,000.

Traffic: W1AOC 47, W1IP 28, W1UN 28, W1COW 25, W1ATJ 5, W1APK 2, W1AUH 2.

VERMONT — SCM, Clayton Paulette, W1IT — W1AOC has dusted the old set off and is getting back into the game. W1BJP has rebuilt his xmitter and is on the air with a 50-watter. Sorry to say, gang, W1CGX is sick and confined to his bed. W1AJG also advised me early in the month that he was confined to his bed with illness. W1BCK is getting real active again. W1BD advises us that he has a brand-new second op. Congrats, OB. Guess no more this time but see you next month and will try to have more news for you.

Traffic: W1IT 36, W1BD 28, W1BJP 12, W1AOC 4, W1BCK 3, W1CGX 186.

WESTERN MASSACHUSETTS — SCM, Dr. J. A. Tessmer, W1UM — W1BMM reports FB results with his new 'phone set. W1AMZ was on for a short time while home. W1BNL finally got his xtal set going. W1BVR has been appointed net control station in the Army Net for Western Massachusetts. W1ZA says he made 236 points in the International tests. W1APL is trying fone. W1BKQ has ten ops and is getting out FB. W1CRX is home from the briny deep. The Prehistoric signal of W1ACV has come up to date since he has put in DC. W1DE is back on and puts out quite a signal. The Springfield Radio Association, W1BWY, reports xmitters on three bands. W1BSJ is working with a Television concern at Stamford, Conn. W1BSN is new traffic manager of the Springfield Radio Association

and applied for ORS. W1DR is coming on with a 50-watter. Ex-W1BKM is now W1BEG, and is building a 3500-ke. xtal fone rig. W1BCB is building a 200-watt fone rig. W1BKS and W1ATK are on. The chief op of WBZ is on as W1HS. W1BVR still hooks them from across the pond. W1BZ is experimenting with 14-mc. fone. The meetings of the Springfield Radio Association are held every Wednesday evening at 76 Cortland St., and all guests are welcome. Any requests for skeds with Springfield should be addressed to O. A. Korrell, W1BSN, 109 Grover St., Springfield, Mass. W1ADO is the chief op at W1BKQ.

Traffic: W1BMM 16, W1AMZ 3, W1BNL 8, W1BVR 36, W1ZA 48, W1APL 22, W1BKQ 30, W1BZJ 30, W1BSN 68, W1BEG 7, W1BZ 5.

CONNECTICUT — SCM, F. A. Ella, Jr., W1CTI — The gang seems to be waking up. That's the spirit. W1AJB has received his ORS appointment. He reports on seven stations in Middletown besides himself. Come on, you Middletowners, don't let W1AJB do all your work. Let's hear from you on the 16th. W1VB has been having some BCL QRM. W1AJS is in mourning over a dead 210 killed by W1AMQ. W1ADW made a trip to Boston and took the commercial exam. W1CKP is back with us again after a trip to Florida. W1AMG is on 3500 kc. looking for schedules. W1ATW received his ORS appointment and is doing some 56-mc. work with W1AES. W1CTI was on 3500 kc. for CTNITE on the 15th. Where was the rest of the gang? W1TD is still looking for schedules. W1RP reports a new station in Bridgeport, W1AZP. W1HQ has been assigned W1AUU. W1AMQ sends in a real report with lots of good information. W1AFK and W1AMQ handled about 50% of the Naugatuck H. S. Basketball team traffic from W1AM on 3500-ke. 'phone. W1AWS, a new station in Milford, is using 3500-ke. CW and fone. W1BOD reports by radio. W1ABL is now an ORS. W1AZG sends in his initial report. W1BI-W1BQH reports. W1BHM paid the SCM a visit and had a fine rag chew. W1ZL is working the sixth district on 3500 kc. with an input of 13 watts to the old UX210.

Traffic: W1VB 5, W1ADW 10, W1AMG 10, W1ATW 28, W1CTI 23, W1TD 12, W1RP 15, W1HQ 9, W1AMQ 114, W1AFK 46, W1BOD 11, W1AJB 19, W1ABL 110, W1AZG 1, W1MK 515, W1ZL 2, W1UE 18.

NORTHWESTERN DIVISION

MONTANA — SCM, O. W. Viers, W7AAT — Two new stations are with us this month, W7AMK at Havre and W7AFY at Bozeman. W7FL reports fair results on 3540-ke. 'phone. W7AAW still gets on occasionally. W7DD is back with us after a brief silence. W7HP has been seeing parts of the world. W7AKN is a new station at Billings. W7AEM paid the SCM a week's visit, and between us we worked everything except Mars and the Moon. Hi! W7DJ and W7TB are trying to find more time for radio. W7AAT now has a real HE station and wants to swap station photos with anyone who wishes to exchange.

Traffic: W7AAT 194, W7FL 27, W7AAW 22, W7DD 19, W7AMK 5.

WASHINGTON — SCM, E. A. Piety, W7ACS — The lead in traffic for this month is taken by W7UA with his first report. The SCM went on the trip to the Navy Yard with about 150 other hams and prospective amateurs. W7ACY purchased an 852. W7OV lost his father, and we all extend our sympathy to him. W7KO is handling a few messages. Chasing BCL troubles is keeping W7AG off the air most of the time. W7EK is on a little more than usual. Doc Bennett kept W7AJH perking out while Brashear was in Seattle. W7MP is moving back to his old stamping grounds at Winton. W7TX is waiting for the Alaskan boys to get to their own places. W7RW got an 852 and is now rebuilding to fit the tube. W7ANF took over W7ANP's skeds while they were rebuilding. The Radio Club in Yakima has a membership of fifty. DX seems to be good for W7NR and W7TK in Everett. W7AHM reports that the Mesny circuit is leading him a merry chase. W7AFD reports for the first time. W7AAX is up to his old tricks in working DX. W7KT, W7MR, W7ACS and W7AFO also help to keep Tacoma on the air. W7KQ moved. W7AMO is the only one to report from Olympia. W7KT is too busy to do much. We have our first report from W7IG at Eatonville.

Traffic: W7UA 118, W7AJH 66, W7OV 56, W7NR 49, W7AMO 39, W7RT 34, W7TX 27, W7EK 26, W7AG 22, W7KO 20, W7ACY 19, W7TK 12, W7AHM 11, W7AAX 10, W7IG 8, W7ANF 8, W7AFD 7, W7KT 6, W7ACS 6, W7MP 4.

OREGON — SCM, W. S. Claypool, W7UN — W7ALM is the high man of the section. He and W7ZD both make the BPL. W7AAR pulls R7 from the Orient. W7JC says "Cancel ORS and RM appointment as I am leaving to pound brass under a Montana Moon." W7MY is thinking of going in for fone on 3500 kc. W7ACH leaves for Alaska to pound brass at KZC. W7AIC wants daily skeds with Portland. W7QK has a DC generator to replace his 900 cycles. W7AOF is a new man in traffic work. W7WL failed to report last month, as he was buried in a new receiver. W7IF says there's a new crop of hams in Coos Bay. W7AMF, a new ORS, just installed a pair of Rectobulbs. W7PE is still the old dependable. W7EO has been sick. W7MV has two UX210's which make very good neon bulbs. W7TO reports much activity in Corvallis. W7AIG's UX281 "faw down." W7AMQ is on the air. W7QY handles a few. W7ANW is with us again. W6DVD requests skeds with a seven at about 6 p.m. daily. W7AJW has been inactive due to installation of 866's.

Traffic: W7ALM 214, W7ZD 128, W7AAR 88, W7JC 89, W7MY 87, W7ACH 75, W7AIC 72, W7QK 37, W7AOF 61, W7WL 57, W7IF 30, W7AMF 30, W7PE 26, W7EO 19, W7MV 12, W7TO 9, W7AIG 9, W7AMQ 6, W7ZY 10, W7ANW 1.

IDAHO — SCM, J. L. Young, W7ACN-7JL — Things have picked up in Idaho this month. The W7ALW boys at Sandpoint lead the state in traffic. W7AFT of Elk River comes in second with a nice total. W7CG had some QRM from the hospital next door. W7ACD reports working five countries this month. He reports a new ham in Shelley, Idaho, and says that Eric Holmberg, exW6CNG-DQO, is putting a 250-watt outfit on 7 mc. W7AFN of Coeur d'Alene reports for the first time. Another Coeur d'Alene ham, W7AT, also favors us with a report this month. The Coeur d'Alene National Guard has a set on the air under the call W7SM. W7AJQ of Sandpoint is on again with 15 watts. W7ACP reports three new hams in Parma. One is W7ALH, the others are waiting for calls. W7ALC is busy building a new portable which will tour the country as W7ZZF, traveling "a la Flivver bug." W7GU has gone back to Marshfield, Ore., for the summer. Our dear friend, W7ADW, remembered by the old-timers as W7ZN and a past ADM of Idaho, is with us again with a 3.5-mc. 'phone set. W7YA, the Boise High School station, is putting the big crystal control set on the air, and will have many operators, headed by W7ST-W7ALD. W7AOC is leaving us to go into commercial work. W7HK, the Nampa H. S. station, is on the air almost constantly during school hours. The following are new stations in Nampa: W7AHS, W7AID, W7AJJ, W7AJK, W7HG, W7VM. W7AJJ has a 7½-watter on the air. W7AHS, W7AID, W7AJK and W7VM have transmitters under construction. Why don't we hear from the following: W7QA-IY, W7GL, W7KA, W7A00, the new ham in Cambridge, W7CJ, W7FB, W7HR, and a few of the other hams in Idaho who are on the air? W7ACN has a 'phone set on the air. He has a transmitter under construction to be used at the C of I under the call, W7JL. His brother, W7HG, is building a portable transmitter.

Traffic: W7ALW 170, W7AFT 46, W7CG 41, W7ACD 32, W7AT 19, W7AFN 15.

PACIFIC DIVISION

HAWAII — The following report was submitted by L. A. Walworth, K6CIB. SCM F. L. Fullaway has returned to service on the U.S.S. *Guide*, NJN. His portable call is K6CXO. During January a severe Kona (southwest) tornado denuded the roofs of the three-story Army Barracks buildings of all transmitting antennas, and the 7000-ke. band was rather quiet in Hawaii. The boys are getting things rigged up and K6AVL, K6DV and K6EWB have been heard again. February found most Hawaiian hams doing little on the air because of interference from mainland stations during the International Contest. Some illegal operation was logged by several of the local stations and reports were sent to the Supervisor of Radio. K6CIB has been rebuilding. A reorganization of Hawaiian amateur radio activities is under way, and efforts are being made to put Hawaii back on the radio map.

Traffic: K6EWB 45, K6CFQ 32, K6ERH 15, K6CIB 6. LOS ANGELES — Acting SCM, C. A. Nichols, W6-ASM — Well, gang, I suppose some of you are surprised to see a new name in the SCM corner, so I will break the secret to you. Mr. Sandham left March 15th on a mapping and exploring expedition into Mexico for the Automobile Club

of So. Calif., and expects to be gone until June or July. He is carrying a portable transmitter and receiver and signing IPH just below the 7000-ke. band. Keep a lookout for him and give him a call. The Pasadena Short Wave Club put on the last quarterly banquet and had Director Babcock as a speaker. The next one will be staged in Pomona in June under the Tri County Radio Club banners. The Long Beach Club continues to meet under the jail in the City Hall every Friday, and welcomes visitors. The A.R.R.C. continues to have some very interesting speakers and the membership continues upwards.

W6ETJ is high traffic man this month. He handled some important traffic for the "Pico Twins." W6FJ and W6ASM while they were at Carmel visiting W6HM. W6WA has a sked with KA1HR. W6AOA is fighting key clicks. W6CUK has an 852 in an MOPA. W6DQV is putting in separate xmitters on 7 and 3.5. mc. W6DTN is trying life at the Naval Academy at Annapolis. W6WZ is out to sea for a spell. This Bakersfield gang certainly are on the go, and should be congratulated. W6WA is the chief up there. W6DIJ is experimenting with fone. W6BVZ has two xmitters now. W6DYK is putting in 14-mc. xtal. W6EEP is a newcomer. W6BES is now on 3500-ke. fone. W6BGF sent two 210s up in smoke in a week. W6DOZ wants an ORS certificate. W6ERL is working plenty of DX on a 210. W6AZL has a daily sked with Denver. W6QP is chief Technician at KNX. W6CVV is another traffic found in Ontario. W6COT says QRM from school. W6OF at Monolake wants a couple of good skeds. W6AGR needs help to get his xtal perking right. W6TE says his new AC receiver is hot stuff. W6AWY is handling traffic with the P. I. stations. W6ACL has been converted to MOPA. W6EAF has a Chevy six and a model A Ford, and wants to race. Hi. W6EGH is one of the official contact stations of the Auto Club Expedition. W6LN is getting the DX bug again. W6CBW is QRL school. W6BZY wants some good skeds. W6ESA won the bug key at the banquet. W6AKD is using ultraudion. W6FJ and W6ASM like Carmel, Calif., very much and don't blame W6HM for staying there.

W6BFI is rebuilding. W6EQD is going xtal. W6BGC took part in the international tests. W6BUX has a screen-grid receiver. W6HT is thinking of giving up the YLs. W6BCK says traffic is hard to find. W6AM likes international tests. W6EKF wants to QSO, but has no dough. W6AKW says KA1AF is going xtal. W6DYJ says skeds all went haywire. W6ZZA is only traveling in three states now. W6MA says peaked audio is plenty sharp. W6DZI is overhauling his lizzie. W6BVT is back again using xtal. W6UJ has been trying 3500-ke. phone. W6CUH is busy with finals at Cal. Tech.

Traffic: W6ETJ 382, W6CBW 289, W6WA 282, W6ESA 210, W6AKD 203, W6DUI 145, W6DIJ 104, W6DLI 100, W6LN 88, W6AOA 76, W6QP 66, W6EGH 63, W6DOZ 63, W6AOB 43, W6BGF 46, W6EAF 35, W6ACL 36, W6AWY 34, W6DQV 33, W6ENH 30, W6TE 25, W6BES 24, W6AGR 23, W6BNO 22, W6DYK 21, W6AZL 14, W6OF 15, W6ERL 13, W6ABI 10, W6COT 5, W6CZT 5, W6ASM 3, W6FJ 2, W6BVZ 2, W6BZY 297, W6CVV 129, W6AKW 302, W6EKE 72, W6AM 58, W6BCK 42, W6HT 24, W6BUX 16, W6BGC 15, W6EQD 12, W6MA 3, W6DYJ 273, W6CXW 25, W6BVT 6, W6UJ 66, W6CUH 3.

SACRAMENTO VALLEY — SCM, Everett Davies, W6DON — The Boy Scout Exposition in Sacramento originated about 200 messages, which were forwarded by W6ELC, W6ESZ and W6DON. The Automobile and Radio Show at Marysville made some very good traffic for W6BSQ. W6AIM says no aerial works like the old fundamental Zepp. W6AK, W6FW and W6AV are back on the air on 3500 ke. They are pre-war spark hounds and old commercial men. W6EBH is a new ham in Lodi and a doctor. W6VDY is doing some nice traffic work. W6DYF worked a Chinaman with his UX210. W6DGQ is using a 50-watt. W6BYB is building a new self-rect. set using two 1-kw. water-cooled tubes. W6CKA is on the air with an MOPA set. W6ELC worked Africa with a 210. W6EMK got his commercial ticket and a job in Alaska. W6AXM is using a UX204. W6AFU is getting QLZ. W6DON is on again using a 50-watt MOPA, and wants a P. I. sked. Stations keeping traffic schedules with any Latin-American countries please get in touch with W6DON at once.

Traffic: W6DON 112, W6BSQ 40, W6AV 32, W6VDV 38, W6DYF 31, W6BYB 18, W6AIM 20.

EAST BAY — SCM, J. Walter Frates, W6CZR — W6AKB leads the section this month in traffic. He was recently given a new portable call — W6EIH. W6EIB is in

second place. W6ALX has been spending much of his time looking at the cup he won the L. A.-East Bay traffic competition. W6ATT handed in a sizable total. W6CTX is getting into Australia and New Zealand in fine shape. W6AMW at Mare Island report that they did not have much time for traffic this month. W6ASH is still on the air with his ancient 210. W6BBE in Berkeley reported for the first time. FB. W6AQ is kept busy as the new CRM of the section and also as secretary of the Oakland Radio Club. W6RJ has cancelled all skeds to devote his entire attention to official observer work. W6ASJ is lining up some active and energetic official observers to stem the off-wave tide and has had a conference with the R. I. W6EDK in Berkeley has been changing his station around. W6BIW has heard the call of experimentation and his new shack is a mess of wires. W6BMS, the Berkeley cherubim (hi), says it's a haywire outfit, but he's back on the air again. W6AUT sends in a big report for the Napa gang. W6EDO and W6BYS are still away on a Naval Reserve cruise. W6CZN has his screen-grid going. W6EDR says there isn't much doing at his shack. W6EY reports that traffic is slow on the QRM band, meaning 7000 ke. W6AIN reports for the first time. W6BSB has resigned as treasurer of the Oakland Radio Club. The club's frequency meter contest was won by W6ASJ. The club had Miss Feiser, W6OK, of the R. I.'s office, and E. M. Sargent, infradyne manufacturer, as guests recently. Jim Warner, operator of the *Southern Cross*, KHAB, has promised to give the gang the low-down on the flight soon. Everybody is getting ready to go to work on the big pre-convention tri-section hamfest which will be held in Oakland sometime around June 7th. W6IP reports from Seattle that he had a great trip on KDUY and is going back to Yoko. W6BI is still pounding out his old signals.

Traffic: W6AKB 464, W6EIB 262, W6ALX 229, W6ATT 222, W6CTX 168, W6AMW 166, W6ASH 150, W6BBE 47, W6AQ 36, W6RJ 28, W6ASJ 26, W6EDK 24, W6BIW 21, W6BMS 12, W6AUT 11, W6BI 11, W6EDR 4, W6EY 3, W6AIN 3.

SAN FRANCISCO — SCM, C. F. Bane, W6WB — I am sure glad to see that the fellows responded so nobly to the call for bigger and better traffic, with the result that we have the biggest total in the history of the section. I would like to take this opportunity of thanking the second op at W6AD, C. W. Gordon, for his FB work. We haven't given him a tumble so far. Hi. W6BIP deserted the YLs long enough to pound out what is probably his biggest total so far. W6ERK is certainly doing some great work as RM. W6ETR, a new man, promises to be one of the big traffic stars of the section. W6AYC hands in his usual good total. W6DBD is building a 28-mc. set. W6WN, W6WB, W6CLS, W6EEG and W6ATI are all trying to smother the 3500-ke. band with fone. After many months of anxious waiting, we finally get a report from that old delinquent, W6DPF. W6DFR took a turn at the international tests. Our latest ORS, W6EKC, is smoking them out with an 852. W6CIS and W6DZQ report as usual. W6PW has been busy installing a new switch-board at the stock exchange. W6EEC is rebuilding. W6ERS is stepping out very nicely on 14 mc. W6KJ says he worked a "9" on 28 mc. W6BTO reports working almost all districts on that frequency. Since W6WB has been on fone he has about two BCLs a night calling on him in quest of dope on transmitters, etc. The A.R.A. and the S.F.R.C. have offered a nice cup to the winner of the traffic contest which will start in April; to win said cup a station must lead the section three times. The contest is open to any "one man" station in the San Francisco section.

Traffic: W6AD 1625, W6BIP 785, W6ERK 573, W6ETR 310, W6AYC 260, W6DBD 162, W6DPF 83, W6DFR 47, W6EKC 43, W6CIS 43, W6PW 8, W6EEC 8, W6ERS 7, W6ATI 4, W6KJ 3, W6DZQ 2, W6BTO 1, W6DTZ 1, W6WB 4.

SANTA CLARA VALLEY — SCM, F. J. Quement, W6NX — W6YG leads the section and makes the BPL. W6HM handled 187 messages across the Pacific to place in the BPL again. W6BYH's reliable sked with W7AAT continues to function. W6ALW handled traffic on 14,000 ke. with a pair of 210s. W6BMW is conducting fone experiments on 3500 ke. W6YU slacked up during the month. W6AME reports weather poor in Modesto. The Modesto Radio Club installed a transmitter at the big Modesto Air Show and handled 102 messages using call W6COO. W6DQH covered the meet. W6BLT is being operated by ex-KFR5, brother of W6BLT. W6BNH has daily sked with

W6BLT, W6BAX and W6AAZ made high scores in the International Tests. The S.S.C.A.R.A. put on a hamfest March 24th. W6BHY handled the eats. Phil Scofield was the speaker.

Traffic: W6YG 22S, W6HM 187, W6BYH 117, W6ALW 43, W6BMW 42, W6YU 33, W6AME 30, W6DQH 30, W6BLT 18, W6BNH 9, W6NX 4, W6COO 102.

ARIZONA — SCM, H. R. Shortman, W6BWS — W6ANO is pounding away at KGSJ. W6EFC turns in an excellent traffic total. W6CDU is thinking of moving into town where he will have 60-cycle supply. W6AWD had a visit from W6BWS, W6EFC, W6EAA and a prospective ham, from Phoenix. W6EAA has turned BCL. W6BWS quit KTAR and is now pounding commercial brass at KGSJ. W6DGN is working everyone on 14 mc. W6DCQ is heard on the air. W6AZM has so much trouble with power interference from the smelter, it is impossible to do any good work. W6CCL is still brass-pounding at sea. W6DGY, W6EOF and ex-GCAJ now compose the technical staff at KTAR. W6EOF having succeeded W6BWS upon his resignation. W6AAM, an old-timer, has blossomed forth with a new UX210. W6APP from Los Angeles is now working in Phoenix. W6DJH, a rabid 'phone hound, may be heard any night on 3500 kc. W6EL has a fone and CW master oscillator. W6CWI seems to be on the air consistently. W6DTU is on 14 mc. W6DSA is back with us after several months in Honolulu. Present address of W6DAU, formerly of San Diego, is wanted by the SCM. W6BWS. W6EH is working in the construction department of Western Air Express. W6EJK, formerly operator at KGSJ, has been transferred to Los Angeles to the technical department. W6CDY-W6CPX is a technician at KGAR. Ex W8AYO is operating at KOY. We understand Ex W9CM is living in Arizona somewhere and if so, the SCM would be very glad to hear from him. W6DRE is operating and announcing at KOY.

Traffic: W6EFC 185, W6DTU 178.

SAN DIEGO — SCM, H. A. Ambler, W6EOP — W6ACJ leads the section. He is getting things lined up for a QSO party for all ORS in this section on the 3500-ke. band. W6EPZ worked two new countries during the test. W6ADC has applied for an ORS ticket. W6BGL has a new push-pull with two 852s. W6EOP found time to handle a few. W6BAM sent his 50-wattter west. W6CTP has one sked. W6EPF moved. W6CTR has a fone on now. W6BAS was away giving lectures on crystals. W6CNK and W6AXU have been trying television. W6HY is building a new xmitter and receiver. W6AJM is on 14 mc. now. W6BFB is on with a 50-wattter. The P. A. T. Club now has twelve members and meets once a week at the homes of the members.

Traffic: W6ACJ 280, W6EPZ 75, W6ADC 48, W6BGL 46, W6EOP 22, W6BAM 14, W6CTP 13, W6EPF 11, W6CTR 7, W6BAS 2.

PHILIPPINES — SCM, S. M. Mathes, KAICY — This report received by radio via W6HM — KA1AC will try his hand as commercial operator on ship in April. KA1AF is back on the air. KA1AW is on every night. KA1AU resumed broken schedules with Q6BXY on March 24th. KA1CE handles considerable traffic with Pacific Coast. KA1CM handles traffic on sked nightly. KAICY will visit Hong Kong, Shanghai, Japanese and Honolulu hams during the latter part of April. KA1DJ moves traffic at forty per with Frisco nightly. KA1EL says now that school is out he will have more time for QSOs and traffic. KA1HC is still busting the ether irregularly with States and AC5GO. KA1HR reports QRL with skeds and heavy traffic. KA1JK has been heard testing. KA1JR has been appointed Asst. SCM for the Philippines Section, and will render section reports after April during the absence of the SCM. KA1PW is on extended Southern Island trip. KA1RC renders first traffic report. KA1ZC has closed until July 1st. KA8AA is back on the air with 500 cycle.

Traffic: KA1AF 94, KA1AW 58, KA1CY 152, KA1HR 983, KA1JR 34, KA1RC 117.

CHINA: At the special request of AC8HM, who has been instrumental in keeping Chinese amateurs organized, we are listing the China reports separately, rather than with the Philippine Island report. The excellent work of "AC" stations is certainly commendable. The following report was sent in by AC8HM via KAICY and W6HM. AC8JK is closing down until October on account of home leave. AC8GO has been in Tientsin for the last few weeks. AC8WP and AC8LS are going strong with screen grids.

Traffic: AC8HM 133, AC8RV 54, AC8AG 40, AC8GO

20, AC8TJ 17, AC8SL 11, AC8RB 8, AC8SZ 7, AC8RP 7, AC8PK 4.

ROANOKE DIVISION

NORTH CAROLINA — SCM, Hal S. Justice, W4TS — W4AA has been appointed Official Broadcast Station. It should now be possible for everyone in the section to get the broadcast easily. W4ZB and W4AHH have been appointed ORS. W4ABV leads the section in traffic again. W4AEW is putting in crystal control. W4UM built a high-speed sideswiper. W4JR is very busy. W4AHH says his 50-watt crystal-control set is working FB. W4DWD plans a few new skeds. W4TS is planning another transmitter. W4AA worked France with his 14-mc. fone.

Traffic: W4ABV 181, W4AEW 77, W4TS 36, W4AHH 31, W4DWD 23, W4AA 14, W4UM 5, W4JR 2.

VIRGINIA — Acting SCM, T. P. Mathewson, W3FJ — W3ZA is working his fone overtime. W3CKL is working his cc 'phone on 14 mc. W3ARU was among the Flight Group from Langley Field ordered to Pacific Coast for maneuvers. W3BDZ says if these auto drivers had learned to dodge poles and fire plugs, he could have gone to Charlotte Convention. W3CA and W3BZ attended the Convention. W3KR is home from school. W3AG's 'phone is working fine on the 3.5-mc. band. W3AVX, an old Morse operator, has a new station in Richmond. W3FJ can get 500-cycle, ICW and PDC notes out of his MOPA. W3HY lost W3KR as op. W3WO is our high traffic man this month. W3AQK aspires to be an ORS. W3HO is struggling to get a dip from the U. of Richmond this June. W3AMB is a scout executive. The Richmond Amateur Radio Club is active again. All hams visiting Richmond are invited to telephone and drop in to see W3FJ.

Traffic: W3CKL 66, W3WO 124, W3HY 10, W3AQK 1, W3AMB 6, W3FJ 16.

WEST VIRGINIA — SCM, D. B. Morris, W8JM — The Wheeling gang has organized a new radio club, and so far have nine active members. W8DPO is rebuilding again. W8CAY comes in with a nice report. W8JM has his hands full trying to keep the Fairmont gang on the air. W3UO, op at WMMN, gave W8BCN a good UX210 tube. W8ACZ is having trouble with the Radio Inspector and has lost W8ACZ as a call. More non-ORS are reporting than ORS. Come on, let's have both.

WSTI is keeping skeds with W8DEN, W4HU and W9GJE. W8AYI still yells for skeds south. W8DFP works 3500 kc. successfully. New stations in Clarksburg are W8CMJ, W8AWT, W8BOK. W8BNF is in school in Maryland. W8CBV, a new ham, reports W8BPA is getting his traffic with 'phone in 3500-ke. band. W8CDV promises action right away on 3500 kc. I am very glad to announce that W. Va. now has an O-O station in W8DPO. He is very capable of filling the position, and I'm sure all members will wish him luck.

Traffic: W8CAY 64, W8DPO 44, W8JM 42, W8ACZ 40, W8BCN 22, WSTI 10, W3UO 18, W8AYI 9, W8CBV 8, W8DFP 3.

ROCKY MOUNTAIN DIVISION

COLORADO — SCM, C. R. Stedman, W9CAA — W9CLJ and W9CAA ran a close race for traffic honors this month, with W9CLJ coming out in the lead. W9CLJ says the Univ. is going to build a ham station. W9AAB is on when his pet power leak permits. W9EAM is keeping a schedule with W8EY once a week. W9CSR can't make the transmitter get out on 7 mc., and his receiver won't work on 14 mc. W9CWX has all kinds of DX to his credit. W9ESA and W9GBQ finally have the DC notes they wanted so badly. W9CHK has been sick but is now on the road to recovery. W9OO is active on 7000 kc. W9CDE got on a little again. W9CCM nearly went west with a bunch of tubes recently when a gang of hoodlums rattled her house with bullets. W9CAB is waiting for some 281's.

Traffic: W9CLJ 72, W9CAA 71, W9AAV 66, W9EAM 21, W9CDE 1.

UTAH-WYOMING — Acting SCM, L. D. Stearns, W6BTX — Our best wishes go to W6BAJ in his travels. W7AAH, a Wyoming man, leads in traffic this month. W6DPO reports a long sick spell, but is better now. W6CNX made some points in the contest. W6BTX handled a few. W6DPJ expects to have his xtal going soon.

Traffic: W7AAH 41, W6DPJ 36, W6BTX 32, W6CNX 22.

SOUTHEASTERN DIVISION

ALABAMA — SCM, Robert Troy, Jr., W4AHP — W4LM leads the state in traffic this month. W4ADN is getting on the air with a portable set and call W4PAJ. W4OH is working everybody on fone. W4AAQ performed a nice piece of work by getting some info on a lost boy from Selma. W4CB worked Calif. on fone with loop modulation on a 245. Troy woke up with a report from W4ZI. W4DS is coming along fine. W4AHR is giving his time to the YLs. W4AJR operates a little with his new R81 rectobulbs. W4AHP is enjoying his AC screen-grid receiver. W4AKB is enjoying his AC screen-grid receiver. W4AKB had the very bad luck to blow his 50-watter. Greetings to W4AEZ, a new ham in Montgomery. W4PAI reports from Birmingham. W4AP is trying a little fone. W4HB has been off the air. Say, fellows, I can't tell what you are doing without a card or something telling me of it. QST still prints the name and address of the SCMs on page 3. Please drop me a line.

Traffic: W4LM 116, W4AAQ 38, W4TI 10, W4AKM 9, W4AHP 8, W4AHR 3, W4CB 1.

GEORGIA-SOUTH CAROLINA-CUBA-ISLE OF PINES — SCM, M. S. Alexander, W4RZ — W4JD says he can give the boys RAC, AC or DC. W4DV has a sked with W1MK. W4SS has been working South America and Europe on 14 mc. W4AFQ now has a commercial ticket. W4JL has been off the air on account of extra work. W4KV is now using xtal control. W4ABS sends in a good report. W4AFQ had one of his frequent line surges which blew the works. W4AAY has installed a new fone. W4GZ is still worrying with the chirp he gets instead of a note. Hi. W4DV has an S52 going. W4HU had a lot of traffic this month. Let's wake up, fellows, and raise our traffic total.

Traffic: W4HU 306, W4ABS 184, W4KV 123, W4BO 34, W4AFQ 44, W4AJH 25, W4JD 19, W4RZ 12.

PORTO RICO-VIRGIN ISLANDS — SCM, E. W. Mayer, K4KD — Five stations reported this month, and traffic reached a new level. K4AAN and K4KD both hit the BPL. K4AKV erected two 85-foot poles for the new government station at Ponce. K4ACF has been laid up with malaria. K4AAN has given up his position with New York, Rio and Buenos Aires Airway Co. K4DK has three operators. K4KD has been appointed N.C.S. for Porto Rico in the Army-Amateur system. K4AAN and K4KD both participated in the international tests. We have a start now, gang. Let's keep it up.

Traffic: K4AAN 281, K4KD 210, K4AKV 13, K4DK 5, K4ACF 1.

FLORIDA — SCM, Harvey Chafin, W4AII — The state traffic banner for the February-March period is awarded to station W4SK at Melbourne. W4AII ranks second place. W4MS says that the call W4QA belongs to Granger, but the apparatus belongs to him. On the 16th of each month W4AII will be on 7000 kc. and will be glad to receive all of the reports that he can by radio. W4SY says no more reporting until he gets his new S52 going. W4MM is the proud owner of a 50-watt bottle. W4JM has gone DX mad. W4OZ managed to pass the test for a commercial second. W4ALH, a newly appointed ORS, is handling plenty of traffic. W4NB is working DX with his newly constructed set. W4AKA manages to handle a few messages now and then. W4AKW has just received his appointment as ORS. W4TK passed his commercial examination and is now assistant operator at WJAX. W4AKH got sick during the International Contest and did not work much DX. W4UJ is a new ham in Jacksonville. W4AGY and W4OO report. W4AAB just got on the air with the help of W4MS. W4ABF also reports for the first time this month. W4BN is working on 3500-kc. fone. W4HY wishes to have his ORS suspended for a few months because of not much time in which to operate. W4TB is located in Tampa for a while. W4ACM, the Naval Reserve Station, and the SCM's station kept in communication with the St. Petersburg-Habana Yacht races through KGAW, the Yacht *Haligonian*. W4MW is the owner of the boat.

Traffic: W4SK 80, W4AII 70, W4QA 52, W4MS 45, W4SY 43, W4MM 32, W4JM 38, W4OZ 28, W4ALH 23, W4NB 14, W4ACM 12, W4AKA 10, W4AKH 8, W4TK 7, W4AGY 3, W4OO 1, W4BN 1.

WEST GULF DIVISION

OKLAHOMA — SCM, W. J. Gentry, W5GF — W5AUV is still hitting a high average in traffic handling. W5CB is also making a very nice average in traffic. W5AAV has been busy at O. U. W5AJW is a new

station to report from Okla. City. W5AYF says the I. B. P. C. is going to have a meeting in Tulsa, May 4th. W5ASQ has moved to Ponca City, Okla. W5AYL is now on the 7000-kc. band. W5ALF is a new ORS. W5ADK is about to get going on fone soon. W5ALM is still loafing on the job. Hi. W5GF is going fair now. Jno. Douglas, Tulsa, is one of the new RM's. Well, gang, let's hear more from you.

Traffic: W5AUV 47, W5CB 40, W5GF 19, W5ALF 9, W5AYL 4, W5AYF 4, W5AJW 3, W5AAV 2.

NEW MEXICO — SCM, Leavenworth Wheeler, Jr., W5AHI — W5AOD stays in the BPL, although he spent a lot of time experimenting. W5BGN is back from his trip East. W5AOU expects to be a traffic station soon. The T.A.T. allowed W5BH to QSO his OW through their fone station while she was enroute to L. A. W5TV keeps in touch with his OW by radio. W5AJL furnished prizes for a traffic contest which were taken by W5AHI and W5AOD. W5ZM reports code practice still being given at NMML. W5ZA is working on a CC 14,000-kc. fone rig. At last, W5ND snagged some traffic. The SCM finally pushed W5AHI into the BPL. The summer slump is about to begin and we have a FB chance to show the Division who we are. We have only the So. Tex. section to beat to take the lead in the Division — will we make the grade?

Traffic: W5AHI 239, W5AOD 109, W5TV 103, W5AJL 100, W5BH 27, W5ZM 14, W5ND 13.

SOUTHERN TEXAS — SCM, Robert E. Franklin, W5OX — This month finds several new hams with us and several old-timers back on the air. Very glad to have you, OM's. Send in your reports and let us know what you are doing. W5AQY just missed his goal for BPL. W5BBY has been quite busy with school work. W5BKE sends in a nice report. W5GS will be away from home for a while and requests the gang to look for his portable, W5TB, on the 7000-kc. band. W5EI, an old-timer, is on the air again. W5UX sends in his report. W5BHO, W5BKW, W5AH, and W5UN are all new Houston hams. W5IU is an old-timer just coming back on. W5BBV is back on with a 50-watter. W5AEA has been working quite a bit of DX on 14,300 kc. W5UN has a fone on the 3500-kc. band. W5MS handled quite a few test messages. W5AQK is on 14,000 kc. W5TO is increasing power. W5ATT got married. Congrats, OM. W5ABJ is building a new xmitter after being off the air for four years. W5AHB is still rebuilding his xtal-controlled station. W5TG, Mr. Jim Hunt, Radio Instructor-Coordinator of the Houston Public Schools, has had the kindness to offer the Houston Radio Club the use of school equipment and rooms for meetings. ORS were in the minority reporting this month. Let's not fall down, OM's.

Traffic: W5AQY 179, W5BBY 135, W5BKE 85, W5GS 68, W5EI 56, W5UX 39, W5BHO 26, W5BKW 21, W5AEA 20, W5MS 19.

NORTHERN TEXAS — SCM, J. H. Robinson, W5BG — W5WW leads in traffic this month. W5BAM is using an 852 in a TPTG circuit. W5JD is building a new receiver. W5BAD is still busy with school. W5BG is keeping a sked on Friday nights with the U. S. A. Airport Station, KFR6, at France Field, Canal Zone. W5AAE is working on 1750-kc. fone. W5BBH at Cleburne reports the activities of the new ham club there. W5BJB has been working 1750-kc. fone all winter. W5GZ reports QRM from school. W5ZY reports for the first time. W5DF is on 14,000 kc. W5JV has been working on 28 mc. every Sunday, and has been QSO W6BXV and W1APO on this frequency.

Traffic: W5WW 115, W5BAM 70, W5JD 56, W5BAD 32, W5BG 22, W5AAE 13, W5BJB 8, W5BBH 7, W5ZY 7, W5DF 2, W5JV 1.

CANADA

WE are not supporting "All-Canada Night" the way we should. Surely we can give up one night of the week to help the game along in our Dominion. Please keep Wednesday nights open for Canadian contacts. Considerable correspondence has been exchanged with the T & R Bulletin of the R.S.G.B. with the idea of having one night of the week for all British stations to get together. So maybe in the near future, "Empire Night" may come to be a reality.

I would like some comments on the use of fone in the 14-mc. band. If this is desired, we must have requests for its use before we can again take the matter up with the Director of Radio at Ottawa.

QST FOR MAY, 1930

XV

ONTARIO DIVISION

ONTARIO—SCM, E. C. Thompson, VE3FC—Central District: VE9AL leads in traffic once again.

VE3DA is runner-up with a very fine showing. VE3BC has had to abandon traffic in favor of school work. VE3CE reports that an Old-Timer of the spark days has returned to the game and is now operating VE3LL with excellent results. VE3GO is getting out first rate. VE3CE is at present off the air owing to alterations. VE3AD has been busy on 7 mc. week-ends. VE3DW, our "low power ether buster," is surely showing the rest of us what a single 201A can do. VE3BP is on the air between spells of hard work as is VE3FC. Toronto now boasts a 3.5-mc. 'phone signing VE3GM. Southern District: The VE3BC-VE3DD combination is still showing the way in DX. VE3ER is working a 3.5-mc. 'phone. Northern District: G. V. Lawrence, VE3ET, ASCM—VE3HU is doing well with traffic. VE3DM handles some, too. There is no question as to whether anyone can hear VE3AG now. Just listen on 3550 kc. and see. VE3GC is having receiving trouble. VE3GD says "130 watts input to ONE little 210 isn't all it might be." VE3BD uses two 201As in a self-rectified circuit. VE3AR has a new receiver. VE3KB will soon have a real fone perking. VE3GG is helping VE3ET get a line on activity in Fort William. VE3BH is on a little. VE3HU would like some VE skeds for Sunday nights. A QSA5, R8 report from Hungary put VE3ET in good humor.

Traffic: VE3ET 26, VE3HU 17, VE3DM 11, VE3GC 1, VE9AL 37, VE3DA 35, VE3FC 8, VE3CB 5, VE3AD 2.

MARITIME DIVISION

NOVA SCOTIA—Acting SCM, A. M. Crowell, VE1DQ—We welcome a new ham in Halifax, VE1GA. EX C1DF hopes to have an outfit going soon. VE1AW is now going strong on 14 mc. (did you land EX VE1BN, OM?) VE1CC is working DX on the "low resistance band." VE1AS has increased power. VE1DQ has decided to give the BCLs a rest and switch to C.W. on 14 mc. Several very enjoyable QSOs were had with the local gang. VE1AK is having fine success with his 500-watter.

NEWFOUNDLAND—Acting SCM, E. V. Jerrett, VOSZ—Glad to note that activity is on the increase. We want to see more of the fellows on 3500 kc. for Canadian prayer meeting Wednesday nights. VOSA is very QRL with line repairs. VOSAN is rebuilding. VOSAE handled some emergency traffic for the Sealing Plane. VOSC is adding and subtracting Mikes trying to improve his note. VOSLC has gone on a Seal Hunter to pound brass. VOSMC spends all his time on 14,000 kc. VOSA W is getting some excellent results with his new Hertz. VOSWG, our most northern station, hopes that his meagre supply of B batteries lasts until his new generator arrives. VOSZ has built a new full-band-spread receiver.

QUEBEC DIVISION

QUEBEC—SCM, Alphy L. Blais, VE2AC—Twenty-one reports this month. Thanks, gang, for the attention given my request. Our CGM, Alex of VE2BE, besides handling important traffic for Hudson Straits, got the first news of the Skott-Sharkey fight through to New England via ZL2AC. VE2CA scores over 800 points in the International Contest. Mrs. VE2CA, second operator at the station, met with an accident and won't be on for some time. VE2BJ has six operators going strong. VE2AD is on fone. VE2AA is after DX on 14 mc. VE2AV is doing fone work. VE2BG's filter condensers blew up on him. VE2EV's antenna fell during a sleet storm. VE2AP is on 3520-ke. fone. VE2AC, our SCM, gave four radio lectures at the K. of C. Hall during the month, talking on amateur radio. VE2BD is installing new equipment. VE2AL, our flying ham, has been making tests with Air-Mail radio equipment. VE2AY will be silent, awaiting new gear. VE2BB complains that conditions are poor. VE2BZ is busy with Bell Telephone repeaters and night school. Don't forget the All-Canadian traffic net. Give a hand and make it a big success.

Traffic: VE2AC 118, VE2BE 53, VE2CA 44, VE2BB 27, VE2BG 12, VE2BD 11, VE2EV 10, VE2AY 7, VE2BZ 4, VE2AL 3, VE2AP 2.

VANALTA DIVISION

BRITISH COLUMBIA—SCM, J. K. Cavalsky, VE5AL—Vancouver: VE9AJ, operating in the 7000-ke. band, will send code practice in the form of a ham bulletin each Tuesday at 10 p.m. VE5CF is a busy

man these days. VE5BE had a narrow squeak when a guy wire he was putting up came in contact with 4400 volts. VE5BC says his Hartley is doing better with his new Zepp. VE5AK hasn't been on very much lately. VE5AC still manages to handle the odd message. VE5AL skeds VE5BA using the 14-mc. and 7-mc. bands. VE5CR is revamping his transmitter. VE5CL handled some traffic. Prince Rupert: VE5GT has his xtal working after some real hard work. VE5GU is the portable of VE5GI. VE5AR has asked twice daily with 5DD. VE5CM is lacking sufficient power. VE5DX is a new station. What's the matter, Victoria? No report from anybody! VE5BR of Savary Island would like a sked with someone in Vancouver on the 3500-ke. band. Whitehorse, Y. T.: VE5AW still continues his DX. VE5AQ is a new ham. VE5FS at Herschel Island has a sked with VE5AW.

Traffic: VE5AL 28, VE5AC 12, VE5BC 3, VE5BA 10, VE5CF 2, VE5CR 5, VE5CL 29.

ALBERTA—SCM, G. F. Barron, VE4EC—VE4EI leads this time with a very FB total. The credit goes to the XYL. VE4EC has rebuilt. VE4AF has his crystal perking. VE4DZ and VE4EA are experimenting on 28 mc. VE4HC reports not much doing around his shack. VE4CU and VE4GT have been busy. VE4FJ is still pounding away with low power. VE4JF is heard occasionally. VE4BV is getting out very FB. VE4EP has started building himself an airplane. VE4GD reports by telegram. Let's have some more dope, gang.

Traffic: VE4EI 78, VE4GD 35, VE4EC 38, VE4FJ 1, VE4EA 1.

PRAIRIE DIVISION

MANITOBA—SCM, A. V. Chase, VE4HR—During a brief spell of good weather, VE4BQ worked six foreigners in two hours. VE4DI has returned from China. VE4JB is experimenting with a single wire fed Hertz. VE4DJ has greatly improved his note. VE4HR is on the 28-mc. band every Sunday. VE4ZZ's official call is VE4GL.

Traffic: VE4DJ 11, VE4HR 10, VE4BQ 2.

SASKATCHEWAN—SCM, W. J. Pickering, VE4FC—VE4BC at Grenfell is a YL. The transmitter at VE4BC is a 201A in a TPTG circuit with B batteries operating on 7 mc. An application for ORS has been received from VE4BB. VE4IH reports the Trans-Canada chain as being in full swing with ten stations in the hook-up. VE4GR reports VE4BL to be on steady now. VE4BX sends in his first report. VE4GO has heard VE4FC. VE4HB has traded his mike for a key.

Traffic: VE4BB 47, VE4IH 41, VE4GR 26, VE4BX 22, VE4GO 6.

LATE AND ADDITIONAL REPORTS

W1AWE is working DX on 7 mc. W8DCG reports direct to HQs. W8BRC will soon be heard on 1715 kc. with a 500-watt crystal-controlled 'phone. A new station, W8CUN, is on the air in this section. W8DC is about to be married. GL, OM. W8BTY is heard on regularly. W8DRA spends part of his operating time on 'phone. W8AAQ was heard in New Zealand on 3500 kc. W8DPI is working on 7000 and 3500 kc.

Traffic: W1AWE 10, W8DCG 13.

Traffic Briefs

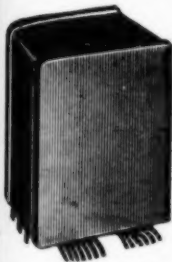
W8CUG kept a regular schedule with W8CFR during his stay in Brazil. W8CFR was visiting PY1AW and by means of this schedule was enabled to keep in touch with home.

Here's the latest explanation of "why tubes go west." This was doped out by members of the San Isabel Radio Club, Pueblo, Colo. . . . A vacuum tube goes west when excess voltage is applied to the filament, because under those conditions the electrons are set going at such an enormous rate of speed that a breeze is created in the tube, which blows out the light of the filament, thereby causing the tube to "go west." How about a "double check" on this?

Have you heard of the BCL who requested that the Broadcast station send its waves at a slower speed, mentioning that his set was fitted with a slow motion dial??



Power Transformers



Size: $5\frac{1}{2} \times 4\frac{1}{4} \times 3\frac{1}{8}$ "
Weight 6½ lbs.

For UY-224 Screen Grid and UX-245 Power Tubes

TYPE GW-380

This shielded Power Transformer was made by General Electric Company. It is an excellent Power Transformer for making up A. C. Receivers, Power Packs, or converting Battery Sets for A.C. operation.

Primary voltage 110-120 volts, 50-60 cycles A.C. current, filament rating 60 watts. Rated to supply filament voltage for two 224, three 226, one or two 245 and one 280, also high plate voltage of 600 volts center-tapped for UX-280 tube. This Power Transformer is very conservatively rated and is exceptionally well built.

SPECIAL \$5.75



Double Filter Chokes



Contains Two 30 Henry 80 Mill Chokes

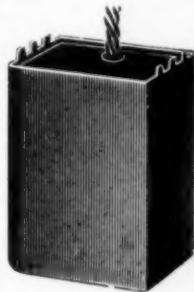
This heavy duty, rugged, double Filter Choke is excellent for all types of filter circuits and experimental work in receiving sets, power amplifiers, eliminators, transmitters and various other purposes.

Made by General Electric Company for Radio Corporation of America, and is RCA Replacement Part No. 8336 for the Radiola 33, 18 and 17.

Each Choke has a 1000 Volt insulation test and the D.C. resistance is 500 Ohms.

When connected in parallel these double Filter Chokes have a capacity of 30 Henries at 160 Mills, and when connected in series have 60 Henries at 80 Mills.

Fully shielded in metal case with special insulating compound. Made of the best parts, including the highest grade of silicon steel.



Weight 6 lbs.

Size: $5\frac{1}{4} \times 3\frac{1}{4} \times 2\frac{1}{4}$ "

List Price: \$10.05

SPECIAL \$3.75

SAMSON SHORT WAVE CONDENSERS

10 mmf. to 125 mmf.

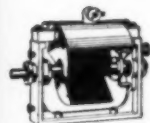
List \$7.00

Special \$1.50

10 mmf. to 75 mmf.

List \$7.00

Special \$1.50



These Short Wave Variable Condensers are precision made and compact. Copper Shielded. This Samson Uniform Frequency Condenser is the finest made for High Frequency Short Wave work. For panel or base mounting.

We also can supply these Variable Condensers in capacities of 250, 350 and 500 mmf. for Broadcast wavelengths at a special price of \$1.25 each.

DUBILIER

FILTER CONDENSERS. Type P. L. 571-4 MFD
600 Volt. D. C. Working Voltage. List \$12.00

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THORDARSON

DOUBLE FILTER CHOKES. Type T 2458
Each choke 18 Henries - 250 Mills. List \$19.50

SPECIAL \$6.25

FILTER CHOKES

30 Henries

120 Mills

Manufactured by the Chicago Transformer Corp. These Filter Chokes have a D.C. resistance of 400 Ohms. Made of Armco extra special transformer steel. Extra size core. Tested at 1600 Volts. With Mounting brackets.

Fine for any type filter circuits.

Special \$2.25



Western Electric

MICROPHONES

An efficient Microphone for use in amateur phone transmission and various other purposes.

Breast Type (without straps).

Special \$1.25



THORDARSON POWER TRANSFORMERS

150 WATT

Delivers 800 Volts (350 m. a.) center-tapped, also 5 Volts (4 amps.) center-tapped.

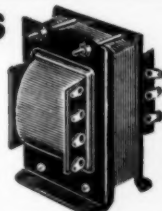
Excellent for use in furnishing power supply to a Transmitter or Power Amplifier.

Using this Thordarson Power Transformer in conjunction with a Filament Transformer is all that is necessary to build up the finest and most powerful A. C. set.

Operates on 90-125 Volts, 50-60 cycles A. C. current.

This rugged, heavy duty Power Transformer weighs 10½ lbs.

SPECIAL \$3.95



Model T-2430-A

Size: $6\frac{1}{4} \times 4\frac{1}{2} \times 5$ "

List Price: \$14.00

AMERICAN SALES CO., 19-21 Warren Street, New York City

Say You Saw It in QST — It Identifies You and Helps QST

THERMIONIC VALVES

DX Easily Obtainable
Consistency in Performance
Uniformity of Characteristics
Made with Platinum Filament

PRICES

Type 250	\$11.75
Type 210	9.75
Type 281	8.25

Cash with Order at Laboratory
in Montclair, N. J.

As a Modulator and Amplifier,
use Type 250

As an Oscillator, use Type 210

THERMIONIC VALVES

for

Talking Picture Apparatus

Telephone and

Telegraph Systems

Sound Amplifying Devices

JOSEPH B. ZETKA

460 Bloomfield Avenue
Montclair, New Jersey
U. S. A.

African work from this country seems to be 1600 G.C.T.

D4AFJ of Wuedlinburg/Harz is now licensed on 5 meters, and carries out regular experiments in that band. A detailed report on these tests is to follow.

Amateurs of the Saar District are using the prefix TS instead of D in accordance with present regulations. All cards for them are to be sent via the D.A.S.D., as usual.

NETHERLANDS SECTION

By H. Pomes, Asst. Traffic Mgr., N.V.I.R.

During January and February conditions remained about the same, which was bad, and only in the eastern part of our country was any improvement noticed. It is a curious thing that in our comparatively small territory the eastern amateurs have quite good results with DX stations, both as regards transmission and reception, while the western amateurs are practically "insulated" and are still waiting for better times.

Although our traffic department is making every effort to bring all 'phone amateurs to the 3500-ke. band, the number on 7000 ke. continues to increase, to everybody's disgust. The 'phone men seem to be devoting most of their effort to increasing their output, on the theory, apparently, that the man with the loudest voice will be able to work over everybody else. Conditions for c.w. in this band are about as good as ever, although usually impossible due to phone QRM. Many Dutch amateurs consider the 7000-ke. band as being virtually lost to them as an active band for this reason, and have gravitated to the 14,000-ke. band. It is this latter band which particularly shows the differences mentioned between the eastern and western parts of the country.

At the present time normal "winter" conditions are reported from the western part of the country, with generally bad DX possibilities and little or no long-haul reception. On the other hand, amateurs in the eastern part report working all over the world with comparative ease. PA0DW again worked all continents (several times) during this period, including 29 VK and 19 ZL QSO's. Much thought has been given as to possible reasons for the great difference between the conditions in the two parts of the country; at present it is assumed that the higher and drier ground, made up chiefly of sand and gravel, is the major influence.

We again want to point out that all Dutch hams use calls made up of the prefix PA followed by the zero (-----) and not the figure ten, as we frequently see in other magazines. There are no divisions here, and the calls do not in any way indicate locations. Since our prefix is now PA, no Dutch amateurs answer calls using the old intermediate EN; please note this.

Our annual meeting was delayed beyond its set date, but was finally held on March 16th; it is hoped that a report of this meeting can be included in next month's report.

SM

Don't Kid Yourself...An Up-to-Date Short-Wave Receiver Must Have:

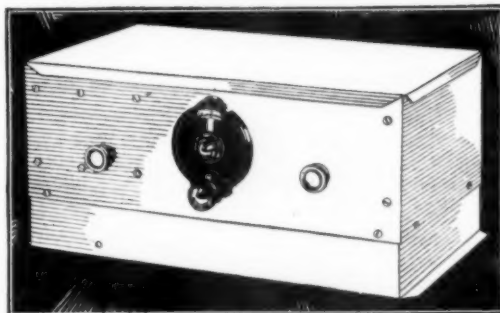
- All-A. C. Operation—**
and That Means *Built-In Power Supply!*
- One-Dial Tuning—**
and That Means a *Real Gang Condenser!*
- Screen-Grid Circuit—**
and That Means *At Least Two S. G. Tubes!*

There isn't any reason for not having these vitally important improvements in your short-wave receiver (you wouldn't look at a *broadcast* receiver that didn't have *all* of them) except that until now no short-wave manufacturer has offered them. From now on, no short-wave set is modern without them!

For Performance—the New S-M 737 Short-Wave Bearcat

Nothing talks like tests—especially on the short waves. Actual tests of laboratory models of the 737 have shown, even in the worst locations, a penetrating power that's uncanny. And with fair conditions the sky is the limit—the actual measured sensitivity of this radically new receiver is such as to assure you of absolutely unbeatable distance-range—and that's with real one-dial operation!

There is nothing on the 737 just because it's "pretty." Perfect "battleship" shielding—that's the starting point. Then there are two double-shielded tuned circuits—'24 screen-grid tubes in two positions—regenerative non-radiating detector—and a powerful '45 second audio stage. Eight specially-designed plug-in coils cover from 16.6 to 200 meters—all American and foreign



S-M 737 Double-Screen-Grid Bearcat

short-wave broadcasting, as well as the "ham bands." Four extra coils cover the American broadcast band (up to 590 meters).

Treat yourself to good short-wave reception: connect up a New S-M Bearcat—and watch it lick its weight in

anything—from insects up!

You'd expect a high price—but it carries, completely wired with *power supply*, in cabinet as illustrated, a list price of only \$139.60, subject to usual trade discount.

Those plain facts mean a scarcity of 737's for a long time to come—there's nothing like this Bearcat on the market at any price. Get your order in now to your jobber—you'll never be satisfied without one!

The Radiobuilder, Silver-Marshall's publication telling the very latest developments of the laboratories, is too valuable for any setbuilder to be without. Send the coupon for a free sample copy. If you want it regularly, enclose 50c for next 12 issues.

4,000 Authorized S-M Service Stations are being operated. Write for information on the franchise.

SILVER-MARSHALL, Inc., 6409 WEST 65TH ST. CHICAGO, - - U. S. A.

Silver-Marshall, Inc.
6409 West 65th St., Chicago, U. S. A.
... Send your latest catalog, with sample copy of the Radiobuilder.
... 2c enclosed; send Data Sheets on 737.
... 10c enclosed; send five new S-M Data Sheets (including the 737).

Name.....
Address.....

▶ PROVED PERFORMANCE ◀



EVEREADY RAYTHEON TUBES FOR TALKING PICTURES, TELEVISION AND ALL INDUSTRIAL PURPOSES

The Eveready Raytheon Foto-Cell is a long-life tube for talking pictures, television and industrial purposes, such as control of illumination, automatic counting, paper-testing, color matching and others. It comes in several standard types, or can be made to specification.

The Eveready Raytheon Kino-Lamp is the first television receiving tube developed commercially that will work with all systems. Each tube is carefully tested.

We welcome inquiries from every one interested in talking pictures, television and Foto-Cell applications of any nature.

The Eveready Hour, radio's oldest commercial feature, is broadcast every Tuesday evening at nine (New York time) from WEAF over a nation-wide N. B. C. network of 30 stations.

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Branches: Chicago Kansas City New York
San Francisco

Unit of Union Carbide  and Carbon Corporation



Trade-marks

NORWEGIAN NOTES

By G. H. Petersen, LA1D, Sec'y, N.R.R.L.

The last month saw a general improvement in both transmitting and receiving conditions, and also a very marked increase in the activity of Norwegian transmitters. Although we have no pioneer work to report in the comparatively unexplored 28 or 3.5 mc. — the latter being "unexplored" for Norwegians — our members are showing much interest in low-power work on the 14- and 7-mc. bands.

LA1G says that conditions on 14 mc. are fine, again. He now works entirely from DX Tables and is able to make contacts regularly with South Africa, Australia and New Zealand. The rest of the Oslo gang is active with European, AU and FM contacts. LA2K complains that his new Philips TB1/50 tube will not "go west" (luckily for him — hi!) but seems to like the Bolshevik hams better, making a lot of EU and AU QSO's.

The Bergen gang has done some fine low-power work. LA2X has again worked W3, and LA2V, on the air for the first time in four months, got a reply from VOSMC on his very first CQ. LA1J made a contact with a running train, XSM5UX, near Stockholm, the Swede using an "indoor" aerial and only 7 watts. He is an expert in low-power work, having worked G with 50 volts and a few assorted milliamperes, and SM with .04 watts!

SWISS REPORT

By H. Degler, President, U.S.K.A.

The licensed Swiss amateurs want it distinctly understood that they are doing everything possible to discourage and locate the few unlicensed Swiss amateurs now operating on the air. All members of the U.S.K.A. are licensed; we do not give any encouragement to the operation of unlicensed stations, and will not forward any QSL cards for such amateurs.

The Swiss QSL service as announced in this department a short time ago is in error. Amateurs wishing to forward cards for Swiss hams should address them to *Swiss QSL Service, Postfach, Berne 2, Switzerland.*

JAPAN

Through the courtesy of Mr. Y. Katsuki, K6DPG, at Honolulu, we learn that a number of Japanese amateurs have been licensed to operate on short waves, most of them being J4's or J1's (followed by two letters, of course, to complete the call) and operating with a maximum licensed power of 10 watts on the 10-, 20- and 40-meter bands.

CHINA

Through Mr. Elliott Sigourney, W6DPF, we have the following report from the VS gang at Hong Kong: "Conditions on 14 mc. are becoming very erratic, and the VS gang has gone with one accord to 7-mc. territory in order to help our western station friends pile up points in the

A NEW Self-Contained Ohmmeter

designed especially for radio service

HERE is an instrument that makes it easy to check radio resistors quickly and accurately. The Jewell Pattern 41 Ohmmeter is a high grade D. C. instrument with a subbase carrying a three cell battery. The instrument is therefore entirely self-contained and independent of external voltage supply. Current drawn from the battery is very low and with ordinary use the battery lasts several months. It can be replaced conveniently.

The knurled knob which can be seen at the bottom of the illustration provides adjustment for battery voltage variation through a magnetic shunt.

In service the binding posts are short circuited before using and the pointer adjusted to the top of the scale by turning the knob. This corrects the instrument to the exact battery voltage available and any resistance placed across the binding posts is accurately indicated in ohms directly on the scale.

Write for bulletin describing the Pattern 41 Ohmmeter and the scale combinations in which this time-saving instrument is available.



Jewell Pattern 41 Ohmmeter



The Jewell Pattern 135 Ohmmeter

Pattern 135 Ohmmeter and D. C. Voltmeter with scale reading both volts and ohms, available in ranges for use with 3 and 4½ volt batteries. The latter range is ideal for radio service work, since the standard set analyzer battery is 4½ volts. Write for a new 16-page bulletin describing the Jewell Patterns 41 and 135 Ohmmeters and the complete line of Jewell Service Instruments.

Jewell Electrical Instrument Co.
1642-C Walnut St., Chicago, Ill.

Please mail literature describing
Patterns 41 and 135 Ohmmeters;
also new 16-page Radio Service
Instrument Bulletin.

Name

Address

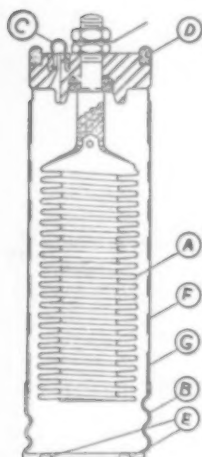
30 YEARS MAKING GOOD INSTRUMENTS

JEWELL

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Say You Saw It in QST — It Identifies You and Helps QST

FOOL PROOF CONDENSER PERFORMANCE



Just try the new Sprague Electrolytic Condenser. Test it and judge for yourself its fool-proof performance. Here are just a few of the reasons why Sprague Electrolytics can give you better service:

A—One piece anode made entirely of pure aluminum; no welded or riveted joints either above or below the electrolyte.

B—Screw type socket mounting making for maximum flexibility in receiver design.

C—Protected vent eliminating the possibility of damaging the nipple.

D—Pressure seal, with no possibility of cutting gasket.

E—Locking lugs in socket to prevent condenser shaking loose during shipment.

F—Shield, precluding possibility of internal short circuit.

G—Individual container allowing space to be utilized with maximum flexibility.

Individual cathodes eliminate all leakage between anodes and allow maximum flexibility in circuit design. Increased life, less leakage and much better shelf characteristics due to anode with edge effect of less than 10% of spiral type.

Leakage current guaranteed not to exceed .2 milliamperes per MFD at 400 volts after 5 minutes or .065 milliamperes per MFD at 350 volts after 5 minutes.

And there are the well known paper condensers made by Sprague—made with the same precise skill as the Sprague Electrolytic. Types and sizes to fit your every condenser need.



SPRAGUE SPECIALTIES COMPANY
QUINCY, MASSACHUSETTS

**Sprague Electrolytic and Paper Condensers
Will Solve Your Condenser Problems**

A.R.R.L. contest. Much QRM is being experienced from the KA stations, but the top score so far is way ahead of that in the last contest. VS6AH (who sent the report — A.L.B.) is old AC1AX, and will be glad to forward cards for the VS6 gang. The address is Box 414, Hong Kong, China."

BRITISH COLONIES

We learn that the prefix VS is assigned to all British colonies in the Far East, with the numeral following this prefix used to designate the particular colony concerned. So far these seem to be:

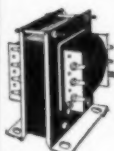
VS1 — Singapore
VS3 — Malaya
VS6 — Hong Kong
VS7 — Ceylon

WAC

The following were issued W.A.C. certificates during the year 1928:

F. N. de A. Costa, sb1AO; L. E. Green, foAIV; Walter S. Keith, nu1CMF; William C. K. Irwin, nu2CUQ; H. D. Huston, nu6BZF; E. G. Smith, eg5YX; Ralph E. Pierce, nu1AXA; John R. Witty, eg5WQ; Don C. Good, nu6AJM; Buck McKinney, nu5ATF; Robert H. Powell, nu1AQT; C. A. Richardson, eg2RX; Donald A. Troy, nu2BIR; J. A. Partridge, eg2KF; Robert J. Browne, oa4RB; Julius Geritz, nu6CTX; Fernand Fontaine, ef8GI; F. L. Stollery, eg5QV; A. F. Sise, nu1ASF; B. W. Thompson, nu1BW; Harold Thomas, nu1ID; Fred Link and J. B. Knight, nu2ALU; W. McDonald, nu2TY; W. E. Jackson, nu3HF; Guy L. Carter, nu4OB; William Penn, nu5AAK; Edwin Lofquist, nu7ABH; Herb Hollister, nu9DRD; Robert Dubs, ef8FR; W. E. D. Bennett, foA3V; F. E. Frost, foA9A; Max Spitzkowsky, oa2MS; W. H. Barber, oa5WH; Hubert F. Lovett, oa7IL; Earl C. Dunn, nu5MX; Paul D. Houghtaling, nu8CJM; Clement Coleman, nu9CRD; C. E. Krohn, nu6DEV; G. A. Sears, nu6BQ; P. B. Curtis, nu1BKE; P. E. Bostaph, nu5AVS; H. G. Musterman, nu2TP; W. Y. McAuley, oa3WM; Vernon L. Harvey, nu6BCH; Yves Naintre, ef8YNB; J. Halenback, nu6CUC; W. H. McAuley, nu6CLO; Curt Relph, nu9BPL; J. E. Mersch, nu5AGQ; G. W. Fisk, ac2FF; Carl Miller, oh6AVL; H. Rieder, oaA4X; C. W. Jones, nu6BYZ; Robert J. Wood, nuSCDB; A. I. Innes, foA4E; Carlos Reiher, sc2AR; G. C. Stevens, sb1BO; G. T. Gulde, oz1FB; D. R. Whitburn, oa5BY; James E. Turner, nu3WM; Roy Gould, nu6DHQ; R. G. Chatfield, oz2AV; K. Keeley, nu6DHS; Lt. Eugenio de Avillez, ep1AE; W. R. Shuler, nu6CSJ; Glenn Morgan, nu5AMO; Glenn Mrans, nu6ADP; R. R. Sawell, ep1BK; B. W. Warren, eg6CI; N. J. Winch, oz1AP; Stephen Lieberman, ej7DD; J. Freitas, sb2AZ; A. T. Hutchings, oa3HL; Charles H. Colman, nu3QT; Robert V. Byron, nu1AVJ; Ingram Patterson, oa3CP; L. H. Thomas, eg6QB; Dr. Joao R. Baccarat, sb2AJ; George Miles, eg5ML; G. Dexheimer, ef8GYD;

THORDARSON TRANSFORMER



Size 6 1/4 x 4 1/2 x 5

150 watts, 400 volts each side of centre tap at 375 M. A. 5 volt filament, centre tap. Fine for power supply for 7 1/2 watt or for crystal control power supply. Specially priced for a short time only. Each **\$3.95**

Net weight 10 1/2 lbs.

Make your own transmitting and receiving coils. Copper tubing transmitting inductance.

Size of tubing

Inside Dia.	3/16"	1/4"	5/16"
2 1/8"	9c	10c	12c*
2 3/8"	9c	10c	15c*
3 1/8"	10c	12c	17c*

Prices per turn.

Ham Green, double silk covered, No. 16 receiving inductance.

2" diameter.....30c per inch
3" diameter.....35c per inch

LEEDS

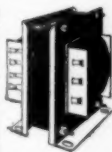
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When in Town Visit Our Store**

EVERYTHING IN
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IN STOCK

THORDARSON B-Eliminator TRANSFORMER

using the Raytheon B-H tube. Will carry the maximum current consumption without overheating. 285 volts on each side of centre. Lower voltage may be obtained if desired. Listed at \$5. Special NOW only **\$1.65**



Size
3 x 4 x 3"

Net Weight
2 3/4 lbs.



NEON GLOW LAMPS

Super Sensitive
For wave meter and other uses; candelabra base. 1/2 watt, 1/4 inch diameter. 1 1/4 inch long over all. Special.....**\$1.75**

Porcelain base socket for above lamp.....10c

Aluminum Shield cans and panels of every description to order.

SPECIAL NOTICE

The 6th edition (second printing) of the Handbook contains 4 pages of items you need from time to time. Look for Them.

Write for special folder and prices

DUBILIER HIGH VOLTAGE FILTER CONDENSER

4 MFD. D.C. Working Voltage 600 V



These Filter Condensers are designed for use in filter circuits in Transmitters, and all high Voltage Socket power devices and Power Packs.

SPECIAL \$2.25

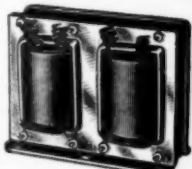
TYPE PL 571

List Price \$7.25

THORDARSON DOUBLE FILTER CHOKES

CONTAINS TWO 18 HENRY 250 MILL CHOKES

Heavy duty, rugged double Filter Reactor for Filter Circuits in Transmitters, Power Amplifiers, "B" Eliminators and various other purposes. Each Choke has a 2000 Volt insulation and the D.C. resistance of each Choke is 108.5 ohms. When connected in series this Filter Reactor has a capacity of 36 henries at 250 mills, and when connected in parallel 18 henries with 500 mills carrying capacity.



SPECIAL \$6.25

MODEL T-2458
List Price \$19.50

1930 SHORT WAVE RECEIVER

A short wave receiver that's got them all beat. Best circuit design and finest mechanical construction. 3-Tube Receiver—detector—2 audio, using three 201-A tubes. Universal type, continuous range 15 to 100 meters; amateur type covers Ham bands 20-40-80 meters with generous spread on the dial. List price \$60. **\$37.50***

SHORT WAVE X-MITTER

7 1/2 Watt Hartley type Transmitter. Will operate with a 201-A tube, with 90 volts on the plate, up to a UX-210, with 30 watts input; has plug in transmitting coils. List price—kit \$55. Completely constructed \$70. **\$57.50***



**By
Insistent
Demand**

LEEDS 50-watt socket, positive contact; heavy phosphor bronze springs, heavy brass shell; highest grade porcelain insulated base; will hold your tube in one position. Specially priced.

LEEDS RADIO LABORATORIES

Precision Custom Built Short Wave Receivers and Transmitters

This department under the supervision of the Short-Wave Specialist, Jerome Gross. We design, construct and advise on any material for the "Ham" Broadcasting station or laboratory. Write Jerry Gross for advice on any of your problems.

PLEASE PRINT YOUR NAME AND
ADDRESS PLAINLY to AVOID DELAY

WRITE FOR
SPECIAL PRICE LIST

MAIL ORDERS FILLED SAME DAY
10% Cash Must Accompany All C. O. D. Orders

To
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THORDARSON

Transformer Specialists
..... Since 1895

Microphone Transformers • Line to
Tube, Tube to Line, Line to Line •
Mixing Transformers • Coupling
Transformers • Filter Chokes •
Audio Transformers • Impedance
Matching Transformers • Power
Compacts • Speaker Coupling
Transformers • Complete Amplifiers

**Thordarson Electric
Manufacturing Co.**

Huron, Kingsbury and Larrabee Sts.
Chicago, Illinois, U. S. A. . . .

R. H. Sainsbury, oa2YJ; C. W. Baker, oa3VP;
E. W. Simms, oa3XS; H. D. Price, eg6HP;
E. Menzies, eg5MQ; G. L. R. Lower, foA6W;
H. F. Abella, su1FC; A. Depuyott, eb4CB;
Allan Caldwell, ac2CK; W. K. Adamson, oa5UA;
H. M. Cooper, Glenleg, S. Australia; Charles
Heiland, nu6DCV; Charles M. Green, nu6DOR;
Charles L. Lundblad, nu6CYX; M. E. Endersby,
nu9AVJ; Henry J. Welsh, nu1CPB, I. D.
Chisholm, eg2CX; H. B. Elsberry, nu6BSN;
Charles Harrison, oa7CH; D. O'Dwyer, co18B;
Harold G. Fownes, oz2GO; George Merriman,
ac1AX; Robert H. Reid, nu4TK; H. T. Petersen,
ed7ZG; J. R. Wells, nu6QL; Bill Martin, nu3QE;
C. F. Bane, W6WB; Tom Jentges, W6BXI;
E. P. Jobe, W6AKD; E. S. Chift, W6BJH; S.
Embling, oa3DC; E. L. Mallette, W6ARV;
T. R. Vianna, sb3QA; H. Brabrook, eg6BB;
H. F. Petersen, ed7HP; San Mateo Junior
College Radio Club station W6JU; Conde de
Thomar, CT1BX; Cid Santos, sb1AK; H. J.
Powditch, G5VL; Willy Blaschek, EAKL.

Staff Changes

(Continued from page 15)

I.R.E. to become communications manager of the
Globe Communications Co. (H. & K.-Dollar) at
San Francisco, Westman was made full secretary
and promptly came to Hartford and demanded
that we do our duty again. We hope the third
time is "the charm."

Our Regulations Are Revised

(Continued from page 20)

be judged only by its external effects. Power
changes were what the authorities most wanted
to have on record. It was finally solved by the re-
quirement that the amateur note his plate watts
input (to the last stage) on his log at every
transmission.

Section IX is a simple authorization of the
Department of Commerce to carry on the routine
licensing of amateur stations. The Department
of Commerce would have no authority over
stations without this declaration. The Commis-
sion is not permitted to delegate any of its dis-
cretionary functions, however, and the legal
situation is necessarily such that all special cases
must come to the Commission itself and be
handled in all due formality as provided in the
Radio Act.

These new regulations are now in effect. The
Radio Division is already at work making the
license changes dictated by the changes in text.
So far as the regulations require change from the
present practice in the individual amateur's
station, they apply at once and each of us should
proceed to make the necessary changes. Al-
though no one will insist or admit that they are
perfect, they are a big improvement over the old
text, they better fortify the amateur position,

A SAFE GUIDE

in the selection
of insulation for
Radio Transmitting
and Receiving Sets

PYREX
RADIO INSULATORS

Where they are used
and
what leading authorities say
about their performance



CORNING GLASS WORKS
Corning, N. Y., U.S.A.

OVER 300 broadcasting stations, leading radio telegraph systems, the United States Army, Navy, Air Mail, Coast Guard and Ice Patrol Services, explorers like Commander Byrd, and exacting amateurs everywhere have utilized PYREX Insulators in many spectacular achievements.

Regardless of whether you are sending or receiving — on land, sea or airplane — you should be thoroughly familiar with the PYREX Antenna, Strain, Entering, Stand-off and Bus-bar Insulators that are helping these leaders to make radio history.

The new PYREX Radio Insulator booklet lists all types and sizes with data that you will want for ready reference.

Return the coupon for your copy, and if you want further advice on any insulation problem, our Technical Staff will answer your questions promptly.

Send
the coupon
for your copy

CORNING GLASS WORKS
Corning, N. Y.

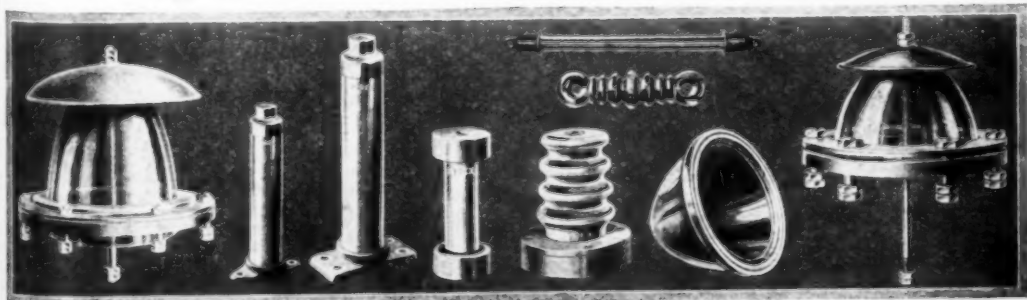
Gentlemen:

Please send me copy of your new
bulletin on Radio Insulators.

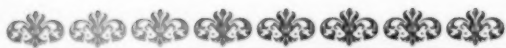
Name

Address

QST 4-30



Say You Saw It in QST — It Identifies You and Helps QST



Cunningham RADIO TUBES

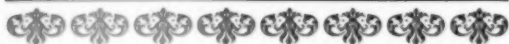


TUBES should be tested at least once a year to be sure they are all alert and wide awake +

+ + + Replace all lazy, worn-out tubes with new, modern Cunninghams.

E. T. CUNNINGHAM, INC.

New York Chicago San Francisco
Dallas Atlanta



and by and large they are the most liberal and the most sensible amateur regulations anywhere in the world today.

Official Frequency System

(Continued from page 42)

While no responsibility, financial or otherwise, is assumed for the accuracy of these transmissions, every effort will be made to have it exceed the figure given.

Reports on Standard Frequency Transmissions are solicited from all who take advantage of this service. No matter how far from or how near to the transmitting station you may be, your report will be of value to us. Standard blanks which will facilitate your filling out and our handling of the reports are available on request. All such requests and reports should be addressed to: Experimenters' Section, American Radio Relay League, 1711 Park St., Hartford, Conn.

After your report has been checked, and acknowledged, it will be forwarded to the Standard Frequency Station upon whose signals it comments.

OFFICIAL FREQUENCY STATIONS

(Required accuracy 3-10 of 1%)

W1AVW-W1ZL, W1AWW, W1AXA, W1BD, W1BZQ, W1CCW, W1CK, W2BO, W2CDC, W2CLA, W2DS, W2EF, W2MU, W2UV, W4BY, W4LK, W5EW, W5OX, W5SP, W4ZAV, W6AKW, W6AM, W6AYC, W6ACE, W6AVJ, W6BB, W6BGM-W6CVO, W6BMW, W6BR0, W5BZU, W6CAE, W6CDY-W6CPX, W6CMP, W6EC-W6XE, W6QL, W6QX, W6WN, W6ZV, W7AAT, W7GQ, W8AQ, W8EQ, W8GZ-W8ZG, W9AHQ, W9ACG, W9BGH, W8BGK, W9BVC, W9CBK, W9BCA, W9CPM, W9EGU, W9IG, G2PD, G2NM, G5BY, G5YK, G15NJ, VE2BE, VE3CO, VE3FC, VE4BT, VK5BG, VK5LF, VK7CW and ZL2AC.

STANDARD FREQUENCY TRANSMISSIONS OF WWV

Schedules of standard frequency transmissions from WWV, The Bureau of Standards, Washington, D. C. will be found on page 8 of the January issue of QST.

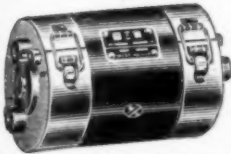
— J. J. L.

Strays

The editorial in the January 10 issue of *Wireless Weekly* (Sydney), entitled, "Amateurs Going Down," contained the news that the privilege of amateur operation in the frequency band of from 1500 kc. to 1200 kc. has been withdrawn. The band is now given over to broadcast activities, since "his (the amateur's) small use of the 200- to 250-meter band may be taken as an indication of his fading interest." Have you ever listened in on 7 or 14 mc.?

BARGAINS

ARMY AND NAVY RADIO SURPLUS



DYNAMOTOR WESTINGHOUSE B. BEARING 12/350 volts, 80 mils. \$18.00

32/350 volts, 80 mils. \$15.00

- Generator, airplane, Signal corps, with shaft, can be used as motor, 12 volt 33.6 amps. 5000 R.P.M. \$10.00
- Generators, 12 volt, 60 amp. has automatic controls. 20.00
- West. Elec. Dynamotor, C.W. 927, two D.C. 32/350 volt dynamotors in noiseless hanger. Used in parallel gives 160 mils at 350 volts, series gives 80 mils. 700 volts, suitable for xmitters and receivers. 25.00
- West. Elec. switchbd. control panel for above dynamotors, has switches, 0-50-500 voltmeter, complete filter system, etc. Special. 8.00
- Ammeter, Weston No. 425 thermo-couple 0-2 amp., mtd. on large bakelite base with D.P. hi voltage switch. 7.50
- Ampere hour meter, Sangamo, battery charge and discharge, type MS 0-500 scale, capacity 15 amp. 10.00
- Milliammeter, Westinghouse, 0-150 surface mtg. b. com. 5.00
- Milliammeter, Westinghouse model PT. C.A. 0-500, zero adjustment, flush mounting. 5.00
- Voltmeter, Westinghouse, type C.A. 0-25, zero adjustment, flush mounting. 5.00
- Voltmeter, Westinghouse, A.C. 8" diameter with external resistance 0-175 volts, 60 cycle power house type. 12.50
- Voltmeter, Westinghouse model PT. 3 scale, 0-5, 0-7.5, 0-150 for measuring A, B and C voltages, portable bakelite case. Special. 3.00
- Motor generator, Crocker Wheeler & Holtzer Cabot, 110 D.C. 220 A.C. 500 watt, 500 cycle. Ball bearing. 50.00
- Complete line 500 cycle motor generators 1/4 to 5 K.W.
- Transformers, General Electric, 125 to 2500, with center tap, 60 cycle, 200 watt. 7.50
- Transformers, Simon, 220 to 11,500 closed core, 1/4 K.W., 500 cycle, "pancake" secondary. 5.00
- Transformer, Amertran, oil immersed, 1 K.W., 500 cycle, 220/8000 volt. 10.00
- Transformer West. Elec., output, No. 102 A, 4 to 1 ratio. 3.50
- Transformer West. Elec., output, No. 202 A, 5 to 1 ratio. 3.50
- Transformer West. Elec., input No. 201 A, 7 to 1 ratio. 3.50
- Condensers, transmitting, Murdock .0017 mfd. 12,000 volt, ideal for plate blocking. 2.50
- Condensers, Wireless Specialty, copper glass leyden jar, 10,000 working voltage .002 mfd. 2.00
- Condenser, Dubilier, mica, op. volts 12,000 cap .0004 10.00
- Condenser, Dubilier, mica, volts 40,000 cap .0012-.001-.0008 or .003. 30.00
- Condenser, Dubilier, mica, op. volts 8500 cap .004 10.00
- Condenser, Dubilier and Wireless Specialty, op. volts 12,500 cap .004. 12.50 to 20.00
- Condensers, West. Elec. 21 A.A., 1 mfd. 1000 volt A.C. test. 1.00
- Condensers, Grid, with leak, mica Dubilier (Aircraft) .003 mfd. 1500 volt, 15,000 ohm 2.50
- Headphones, West. Electric No. 194W same as C.W. 834, 2200 ohms, D.C. slightly used. 5.00
- Holtzer Cabot, "Mike" Utah Western Electric Radio-type, carbon granular trans- phone Transmitter unit, mitter. Special. \$.95 326W. Special. \$1.50
- Dynamotor, GE Navy Airplanes 24/750 volts. Aluminum frame, unusually good for airplane test work. Specially priced, 200 mils. 25.00
- Dynamotor, aircraft 32-275 volt, with shaft. 10.00



HEAD PHONES U. S. NAVY

Pair **75c**

80 Ohms. Excellent for practice and instruction purposes. High grade make.

Largest Radio and Electric Supply House in U. S. specializing on Army and Navy Surplus. Write us your particular requirements. Sufficient postage and deposit of 20% required on C.O.D. orders. NO C.O.D. ON CANADIAN ORDERS. DUE TO LIMITED GOVT SURPLUS WE DO NOT ISSUE CATALOGS.

MANHATTAN ELECTRIC BARGAIN HOUSE, Dept. Q, 105-7 Fulton St., New York City

- NAVY Dynamotors General Electric 24/1500 volt. 233 mils. \$37.50
- Edison storage battery cells, nickel alkali, 225 amp. hour, 1.2 volt type A-6, weight per cell 20 lbs. 4.00
- Coils, Retardation, West. Elec. Co. 57C, .83 ohm, 2 windings. 1.00
- Ret. coil West. Elec., No. 65 A, 1800 ohm 12 henry. 2.00
- Ret. coil West. Elec., No. 66 A, 85 ohm 1.3 henry. 1.50
- Ret. coil West. Elec., No. 61 B, 11 ohm 1 henry. 1.50
- Induction coil, platinum contacts, can be used as Hi. pitch buzzer. 1.50
- Telegraph and buzzer portable sets, mahogany case, 2 tone 4 contact platinum contact high frequency buzzer, 2 telephone toggle switches, potentiometer, sending key, 3 mfd. condensers, transformer and 2 choke coils, receiver, \$30. value. 5.00
- Magnetos, Army mine and ringer type, 4 large magnets. 1.00
- Battery, U. S. Army, lead-acid type, 10 volt, 20 ampere hour. Consisting of 5 individual 2 volt cells in carrying case. 5.00
- Sounders, Signal Corps, 120 ohms, adjustable. 2.50
- Spark transmitter, complete, airplane type, rotary gap, transformer, mica condenser, 200 watt 500 cycle with Gen. self x-cited ball-bearing. 35.00
- Generators, Westinghouse 110 volt, A.C. 900 cycles, 200 watts, self excited. 15.00
- Generator 1/4 kw. 500 cycle, 300 volt, self x-cited, can be hand driven. 25.00
- Voltmeters, D.C. portable new Weston model 45, 3 scale 0-3-15-150 guaranteed 1/4 of 1% accurate. 40.00
- Ammeters, D.C. portable, new Weston model 45, 3 scale 0-1.5-15-150 with 3 scale external shunt and leads 1/4 of 1% accurate. 40.00



LOUD SPEAKER \$5.00

UNIT 193 West. Elec. Ideal for mounting. Transmitter with Horn

- Headphone, Army, with strap, 120 ohm. 75
- Headphone, Radio School, leather headband, 75 ohm. 1.50
- Keys, transmitting, Navy, back connected on bakelite base. 2 kw., 3/4-inch silver contacts. 5.00
- Keys, xmitter, 2 kw., comb. relay and hand 1/4" silver contacts. 10.00
- Keys Navy, 1/4" silver contacts. 1.50
- Charging panel, Navy type, S.E. 899, 32 volt, Ward Leonard, var. and fixed res., Weston voltmeter and ammeter. Sangamo ampere hour meter. Complete with all switches. 30.00
- Buzzers, Western Electric, Extra quality, high frequency. 1.50
- Receivers, Navy, C.N. 240, 1000-10,000 meters. 50.00
- Receivers, S.E. 143 and I.P. 500. 100-150
- Resistors, vitrohm, screw base, 600, 900 or 2000 ohm. .50
- Resistance, variable 200 ohm 1.5 amp. 1.00
- Rheostat vitrohm, variable Ward Leonard, 500 ohm .2 to 1.5 amp 35 tap field reg. type. 5.00
- Rheostat, vitrohm, variable, Ward Leonard, 6 ohm 15-5 amp. bat. charge type. 3.50
- Resistors, vitrohm Ward Leonard, with leads, ass. sizes per doz. 1.50
- Relays 2 and 5 kw. (110 or 220 volt) 1/4 silver contacts. 7.50
- Relay West. Elec. low voltage, 2 upper and 3 lower platinum point screws, 3 contact arms. 5.00
- Extra platinum contact screws or arms. .35
- Amplifier, W.E. Radiophone, C.W. 926. 15.00
- Heterodyne, Signal Corps, type B.C. 104. 1000 to 3000 meters, with detector. 15.00
- Receiver, Type 122, 175-775 meters. Especially recommended for "standby" for coastal Broadcast stations as required by Dept. of Commerce. 50.00
- Air compressors, Kellogg, Model T. 1 1/2 cu. ft. per min. weight 6 lbs., 600 R.P.M., 125-lb. Requires 1/4 h.p.. 3.00
- Motors back geared 110 A.C. variable speed, auto reversible (Socony oil burner type) has over one thousand uses, a very good buy. 7.50
- Motor generator, R & M, 110 D.C. 3 1/4 h.p., 2 kw. 20 volt D.C. 80 amp. Great for large station filament supply. 125.00
- SPECIAL — U. S. Army instruction book on telephony or telegraphy. Hundreds of pictures and diagrams. 1.00

CONTROL

is half
the battle!

Eyes glued to the range finder — delicate nerves of wire from the conning tower to the gun turrets . . .

Less dramatic but mighty important is the delicate control that holds in check the powerful amplifications of your radio tubes.

SERVICE MEN!

First come — first served. Send 25c for the New Centralab Volume Control Guide exclusively for Service Men. Send your Letterhead or Business card.

For smooth, efficient performance be sure the volume control on your radio is **CENTRALAB**.

Write Dept. 320-F
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Three Boons to Amateurs

HY-7 Six-tube, double-detection receiver. Strictly short-wave. 3 Screen-grid tubes, D.C. set, first detector screen-grid. Oscillator tuning points 3000 kc. apart, repeat point off dial. W3PT says, "Use 10 foot antenna on 20 meters. W7EK, F8CT, UQ2OZ, etc., QSA3 — 5 on loudspeaker. Some set!" He gets XDA, QSA5 on loudspeaker with 4 feet 9 inches of antenna.

QSA-Meter Answers QSA, and beats guesswork. A low-priced, panel mounting, volume-estimator. Scale points, 1, 2, 3, 4, 5, with half-points marked. You can't repeat guesses within 30%, but QSA-Meter repeats to 5% or better. Why guess? Make your reports mean something.

Voltma 1000 ohms per volt voltmeter and milliammeter. Choose your scales. Needs only 1 ma. for full scale voltage. Prices as low as \$8.95 for double-purpose meter. Weston or Jewell Movements. Bakelite cases. State your needs when you write for price.

Get Full Particulars and Prices on Any
of These Amateur Devices, Write Today.

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Phone
5-2753

HARTFORD - CONNECTICUT - U.S.A.

The All-Section Sweepstakes Contest

(Continued from page 46)

Manitoba	VE4IC	144	144
Montana	W7AAT	144	144
Mississippi	W5AOM	112	112
No. New Jersey	W2ALO	32	
	W2WR *	2	
	W2UK *	8	
	W2JF *	8	
Alberta	VE4GD	32	50
	VE4E1 *	8	
British Col.	VE5BU	24	40
	VE5BL *	2	
Md.-Del.-D. C.	W3CJ	8	26
No. Minnesota	W9BBL	8	8
Maine	W1TB *	2	8
			2

* These stations not actually taking part.

Changes in A.R.R.L. Standard Frequency Service

(Continued from page 47)

frequency measuring equipment used at Round Hill is of the highest order and there is no questioning a frequency check made by the operators there. If they tell a fellow he is off frequency — he is off frequency. This is service on a silver platter; if the gang doesn't take advantage of it we are an ungrateful lot indeed; if we do use the service but do not drop W1AXV a card acknowledging our appreciation, we are even more ungrateful.

The operators at W1AXV may not be able to hear every station calling them for a frequency check, but those who cannot raise W1AXV but who can hear them should stand by for the regular Standard Frequency Transmissions which follow. These schedules are published in alternate issues of *QST* and are in this one.

Our enthusiasm over the good news from W1AXV is tempered by an announcement from our other Standard Frequency Station, W9XL. Because of an expansion in the activities of WCCO, whose operators also operate W9XL, the standard frequency transmissions from this station must be suspended after June 1st.

The boys at W9XL have served amateur radio yeomanly since away back in 1926 when they first began transmitting standard frequencies on regular schedules under the amateur call, W9WI. Transmitting standard frequencies by its very nature is pretty much a service for service's sake — and those who give it receive appreciation greatly disproportionate to the time, effort and exactitude involved. Whether it be the truth or not, we amateurs seem to take too many things for granted,

R. T. I. QUALIFIES YOU TO MAKE MONEY AND ITS SERVICE KEEPS YOU UP-TO-THE-MINUTE ON THE R. T. I.
NEWEST DEVELOPMENTS IN RADIO, TELEVISION AND TALKING PICTURES



Train at Home under this Eminent

Radio now offers ambitious men the greatest Money-Making Opportunity the world has ever seen! Hundreds of trained service men are needed by radio dealers, jobbers, and manufacturers!

A "trained" Radio "Service and Repair" man can easily make \$10 to \$50 a week, and it's very common for a "trained" man with experience to make \$75 a week, and up

BIG MONEY for spare-time Radio Work is easily made in every city and village. You can now qualify for this Big-Pay work quickly through R. T. I. Get the Big Money Now and go up and up in this Big Pay field. The Radio industry calls for More Men, and R. T. I. supplies what the industry wants you to know.

Supervised by Radio Leaders

R. T. I. training is prepared and supervised by prominent men in radio, television and talking picture engineering; distributing; sales; manufacturing; broadcasting, etc. These men know what you must know to make money in Radio. You learn easily in spare time at home with the R. T. I. wonderful combination Testing Outfits, Parts, Work Sheets, Job Tickets. It is easy, quick and practical—covers everything in Radio—includes Talking Pictures and the latest in Television.

The man with thorough training in radio has opportunity without limit.



THE R. T. I. ADVISORY BOARD. These men are executives with important positions in the radio industry—manufacturing, sales, service, broadcasting, engineering, etc., etc. They supervise R. T. I. Work Sheets, Job Tickets, and their training methods.

R. T. I. TRAINS YOU AT HOME FOR A GOOD JOB OR A PROFITABLE PART TIME OR FULL TIME BUSINESS OF YOUR OWN

No Experience Needed

ALL YOU NEED is the ambition and the ability to read and write. The Radio industry needs practical trained men. Remember, R. T. I. makes it easy to earn spare time money while you learn at home.

More to come

THE MEN who get into this Big-Money field now will have an unlimited future. Why? Because this billion dollar Radio industry is only a few years old and is growing by leaps and bounds. Get in and grow with it. \$10 to \$25 per week and more is easily made in spare hours while you are preparing for Big Money. **TELEVISION**, too, will soon be on the market, so the leaders say. Be ready for this amazing new money-making field. Remember, R. T. I. "3 in 1" home-training gives you all the developments in Television and Talking Picture Equipment, together with the complete Radio training.

Warning

Do not start R. T. I. training if you are going to be satisfied to make \$15 or \$20 per week more than you are now. Most R. T. I. men will make that much increase after a few weeks. There is no reason to stop short of the Big Money Jobs or the Big Profits in a spare time or full time business of your own. No capital needed. Get started with R. T. I. now. Make money while you learn at home.

R. T. I. Book Now FREE

The thrilling story of Radio, Television and Talking Pictures is told with hundreds of pictures and facts—it's hundreds of big money jobs and spare time money-making opportunities everywhere. Send for your copy now. **USE THE COUPON.**

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Twenty years Radio experience. First to establish two-way amateur communication with Europe. Former Traf. Mgr. of American Radio Relay League. Lieut. Com. U. S. N. R. Inventor, designer, consulting Radio engineer.

Assisting him is the R. T. I. Advisory Board, composed of men prominent in the Radio Industry. These men know Radio and will help you succeed in their field.



YOUR A.R.R.L. EMBLEM



The League Emblem comes in four different forms. Its use by Members is endorsed and encouraged by the League. Every Member should be proud to display the insignia of his organization in every possible way.

THE PERSONAL EMBLEM. A handsome creation in extra-heavy rolled gold and black enamel, $\frac{1}{2}$ " high, supplied in lapel button or pin-back style. The personal emblem has come to be known as the sign of a good amateur. It identifies you — in the radio store, at the radio club, on the street, traveling — you can spot an amateur by it. Wear your emblem, OM, and take your proper place in the radio fraternity. Either style emblem, \$1.00, postpaid.

THE AUTOMOBILE EMBLEM. 5 x $2\frac{1}{2}$ ", heavily enameled in yellow and black on sheet metal, holes top and bottom, 50c each, postpaid.

THE EMBLEM CUT. A mounted printing electrotpe, the same size as the personal emblem, for use by Members on amateur printed matter, letterheads, cards, etc. \$1.00 each, postpaid.

THE "JUMBO" EMBLEM. How about the shack wall or that 100-footer? Think of the attention this big yellow-and-black enamel metal emblem will get! 19 x $8\frac{1}{4}$ ", same style as Automobile Emblem. \$1.25 each, postpaid.

**The American
Radio Relay League**
Hartford, Conn.

particularly those services requiring the least effort on our part.

The gang at W9XL has gone right along making a fine job of the work voluntarily undertaken, their only recompense a few QSL cards and heartfelt thanks from those sufficiently appreciative of a valuable service — and thoughtful enough to acknowledge it.

Three and a half years is a long time to keep a schedule consistently and dependably going just for the fun of it, as any brass pounder will admit, but that's what Hugh McCartney, Lyall Smith, Ivan Anderson, and George Collier have been doing at W9XL. We are grateful to them and wish them all the best of luck and 73.

— J.J.L.

Experimenters' Section

(Continued from page 51)

Modern Practice in High Frequency Radiotelephony, Hull, p. 9, April, 1929.

An Effective Low-Cost 'Phone and C. W. Transmitter of Modern Design, Lamb and Dudley, p. 9, September, 1929.

WTIC — A Modern 50-kw. Broadcast Station, Lamb, p. 9, October, 1929.

New Crystal Fragments, Experimenters' Section, p. 41, November, 1929.

Quartz Crystal Facts, Hollister, p. 29, January, 1930.

14-Mc. 'Phone Transmission, Dudley, p. 17, March, 1930.

PROCEEDINGS I.R.E.:

The Piezo-Electric Resonator, Cady, April, 1922.

Uses and Possibilities of Piezo-Electric Oscillators, Hund, August, 1926.

Piezo-Electric Crystals at Radio Frequencies, Meissner, April, 1927.

Note on Piezo-Electric Generators with Small Back Action, Hund, August, 1927.

Modes of Vibration on Piezo-Electric Oscillators, Crossley, April, 1928.

Bibliography on Piezo-Electricity, Cady, April, 1928.

Piezo-Electric Resonator and Its Equivalent Network, Van Dyke, June, 1928.

Thermostat Design for Frequency Standards, Morrison, July, 1928.

A New Type of Standard Frequency Piezo-Electric Oscillator, Wheeler and Bower, August, 1928.

Notes on Quartz Plates, and Gap Effect at Audio Frequency Generation, Hund, August, 1928.

The Dependence of Frequency of Quartz Piezo-Electric Oscillators Upon Circuit Constants, Terry, November, 1928.

GENERAL RADIO EXPERIMENTER:

Piezo-Electric Quartz Plates, February, 1930.

BOOKS:

Radio Amateur's Handbook.

Principles of Radio Communication, Morecroft (2nd edition).

Principles of Radio, Henney.



Here is the way to do it!

Recently when looking for a new home, W2VG (who, of course, had to consult his XYL) found that one of the apartments had a bedroom so laid out that the clothes closet was directly opposite the windows. W2VG is now located in the clothes closet and is such an improvement over the former station that Mrs. W2VG takes an active interest in the station, even putting up QSL cards for the OM.

QST Oscillating Crystals

REDUCED PRICES EFFECTIVE APRIL 1st, 1930

AMATEUR BANDS:

Summer is coming, and no doubt you are going over your transmitter removing those weak links so as to get the most possible efficiency from your set.

One item of great importance is the frequency stability of your set. Does it stay on one frequency? If not, our power crystals will solve that problem. SCIENTIFIC RADIO SERVICE crystals are known to be the best obtainable, having ONE single frequency and highest output. With each crystal is furnished an accurate calibration guaranteed to better than a tenth of 1%. New prices for grinding power crystals in the amateur bands are as follows:

1715 to 2000 Kc band \$15.00 (unmounted)
3500 to 4000 Kc band \$20.00 (unmounted)
7000 to 7300 Kc band \$40.00 (unmounted)

BROADCAST BAND:

Power crystals ground in the 550-1500 Kc band accurate to plus or minus 500 cycles of your specified frequency fully mounted for \$55.00. In ordering please specify type tube, plate voltage and operating

temperature. All crystals absolutely guaranteed regards to output and frequency and delivery can be made within two days after receipt of your order.

CONSTANT TEMPERATURE HEATER UNITS:

We can supply heater units guaranteed to keep the temperature of the crystals constant to better than a tenth of 1 degree centigrade for \$300.00. Two matched crystals, ground to your assigned frequency in the 550-1500 Kc band with the heater unit complete \$410.00. More detailed description of this unit sent upon request.

ATTENTION AIRCRAFT AND COMMERCIAL RADIO CORPORATIONS:

We invite your inquiries regarding your crystal needs for Radio use. We will be glad to quote special prices for POWER crystals in quantity lots. We have been grinding power crystals for over five years, being pioneers in this specialized field, we feel we can be of real service to you. We can grind power crystals to your specified frequency accurate to plus or minus .03%. All crystals guaranteed and prompt deliveries can be made. A trial will convince you.

SCIENTIFIC RADIO SERVICE

"THE CRYSTAL SPECIALISTS"

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Dept. P-12

Mount Rainier, Maryland

EASTERN AMATEUR HEADQUARTERS



SPECIAL
\$7 Weston
Volt Meter \$1.79

We pay postage
7 volt d.c. Not many at this price

Complete Parts
Loftin-White Power Pack

R. C. A. Sockets for Transmitting, \$1

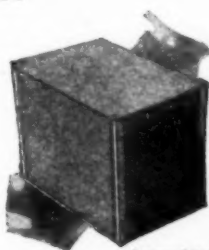
ALUMINUM BOX SHIELDS

Size 9" x 5" x 6"

Excellent for assembling your
oscillator, monitor, wave
meters, short wave compar-
ators, etc.

Amateurs' Special Price \$2.10

We carry in stock complete line
of De Forest Transmitting
Tubes, Frost "Mikes," Sig-
nal Keys and Buzzers, Pilot
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Assembled

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1920

1930

Dodge Radio Shortcut

LEARNING code old way W9AJH stuck at 4 per. Tried
DRS and passed First Class in five days. W9DRZ easily
raised from 10 QSZ to 25 QSQ.

Dodge High Speed

W5AHM raised speed from 27 to 39 per in 75 minutes —
5 practice sessions, 15 minutes each.

Dodge Morse Shortcut

KILLS Mixup — Used by W2BXY, W5ANW, W8CJK
(KDWI), W8BFA, W9EBF (KMMJ) — all Commercials.

CONSECUTIVELY USED

QUALIFY in least time, with least effort for highest
code speed test required.

Code Methods \$5 each or SET (3) one order \$10.
Money Order — C. O. D. and Postage in United States
if send \$1. MAY SPECIAL — \$10 NOW (less amount
already paid). Completes your SET. Get on Band
Wagon.

C. K. DODGE

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Mamaroneck, N. Y.

DON'T YOU BE DISAPPOINTED TOO!

Every day we are requested to furnish back copies of *QST* — which we gladly do if they are still in print. The request frequently reads something like this "Please rush a copy of the issue of *QST*. Mine is lost or misplaced. Can't proceed with my new transmitter until I get that copy."

What a sad blow if that issue is out of print! Unfortunately, we frequently have to give the bad news.

Now, knowing that *QST* probably has greater reference value than any other radio publication, you should resolve to keep past and future issues in a

QST Binder



Note the wire fasteners. Unnecessary to mutilate copies. Opens and lies flat in any position.

One-fifty each
postpaid

A binder will keep your *QST*s always together and protect them for future use. And it's a good-looking binder, too.

QST
1711 Park St., Hartford, Conn.

A New Electrolytic Condenser

(Continued from page 54)

copper can which also acts as the container for the unit, and has a Mogul type screw base. A copper socket for mounting the unit is supplied with each condenser. The capacity of the unit is 8 μ d. at 400 volts, the series leakage current after five minutes of steady operation at the rated voltage is 0.3 m.a. or less. The over-all size of the unit is 5 inches long by 1 $\frac{3}{8}$ inches in diameter.

Such a unit should find wide application in amateur transmitters. It is quite compact, and two may be connected in series to form a 4- μ d. condenser to be used in the filter for the usual transformer and rectifier system supplying 500 or 600 volts to a Type '10 transmitter. Further ways of using electrolytic condensers were described in *QST* for March, 1930.

Roanoke Division Convention

(Continued from page 25)

man Gluck, W4CQ, had his newest S/W super on display. Valuable prizes were awarded for all the contests held during the convention sessions. After the drawing which followed for the apparatus which remained, in which nearly everyone got some useful piece of equipment, the convention was declared officially closed.

The Charlotte Amateur Radio Association was sponsor of this Convention. The members of the Convention Committee, E. J. Gluck, W4CQ-WBT (Chairman), G. S. Smith, W4BX (Secretary), Paul Rosekrans, W4AGE, and S. L. Hall (Publicity), "Bob" Morriss, W4JR (Registration) and G. D. Bruns, W4AEN (Finance) and all who assisted them deserve thanks and congratulations. Excellent planning and coördination by those in charge can be held accountable for the success of the convention and the good time had by all. After a rising vote of thanks and without a dissenting vote, the gang acclaimed Charlotte the place for next year's gathering. Take a tip and don't miss it! — F. E. H.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912, of QST, published monthly at Hartford, Conn., for April 1, 1930.

State of Connecticut } ss:
County of Hartford }

Before me, a Notary Public in and for the State and county aforesaid, personally appeared K. B. Warner, who, having been duly sworn according to law, deposes and says that he is the business manager of *QST* and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The American Radio Relay League, Inc., Hartford, Conn.; Editor, Kenneth B. Warner, Hartford, Conn.; Managing Editor, none; Business Manager, Kenneth B. Warner, Hartford, Conn.

2. That the owners are: (Give names and addresses of the individual owners, or if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent. or more of the total amount of stock.) The American Radio Relay League, Inc., an association

TALKS TO LONDON FROM PLANE IN AIR

Reporter in Craft Speeding
Over City Has Conversation
Across the Ocean.

THREE CALLS ARE MADE

Words Understood Clearly in Spite
of Static—Electric Experts
Pleased With Results.

Special to The New York Times.
RADLEY FIELD, N. J., June 25.—
Flying at ninety miles an hour today
with a thick fog blanket blotting out
the earth below him, W. W. Chap-
lin, Associated Press reporter, casual-
ly turned to a microphone and
asked for the London office of the
news association. The request, re-
layed through the laboratories of the
Bell Telephone Company, passed on
to the radio ocean radio telephone
station at Belfast, Me., and then car-
ried again on the air across 3,000
miles of ocean to London.
The connection was made quickly
and Chaplin asked that Miss Martha
Dalrymple of the London office be
routed to the phone. The conversa-
tion, once greetings were over,
Chaplin said later, had to do mostly
with the weather. It was broken
somewhat by static but the two
persons talking, one in a fog-bound
plane a half-mile in the air and the
other in a fog-bound London office,
understood each other and ex-
changed greetings.

"ESCO" Airplane Generators provided the power for this remarkable achievement

Two "ESCO" Airplane Generators
(wind driven) were mounted on the
Bell Telephone Airplane. One sup-
plied power to the transmitter and
the other to the receiver. Both were
of standard "ESCO" design which
insures reliable service under the severe operating conditions
common to aviation.



Low wind resistance, light weight, non-corroding parts, ball
bearings, tool steel shafts, steel shells, cast steel pole pieces,
weather proof construction, many sizes to choose from, high
voltage and low voltage windings to suit individual require-
ments, are a few of the many reasons for "ESCO" generators
being the first choice.

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a real operator. Complete code instructions furnished
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teach you the code or it costs nothing.** Speedy, simple,
clear. Ideal for advanced students or beginners.

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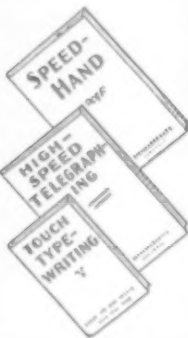
TELEGRAPH TOUCH-TYPE-WRITING—the only typing course teaching the correct use of the "mill" in telegraphy. Doubles typing speed in few days.

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6343 S. Kedzie Ave., Dept. RL
Chicago, Ill.



Walter H. Candler
Former World's Champion Operator and Author of The Candler System Courses



without capital stock, incorporated under the laws of the State of Connecticut. President, Hiram Percy Maxim, Hartford, Conn.; Vice-President Chas. H. Stewart, St. David's, Pa.; Treasurer, A. A. Hebert, Hartford, Conn.; Communications Manager, F. E. Handy, Hartford, Conn.; Secretary, K. B. Warner, Hartford, Conn.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear on the Books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements, embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association or corporation has any interest direct, or indirect in the said stock, bonds, or other securities, than as so stated by him.

5. That the average number of copies of each issue of this publication, sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is.....
(This information is required from daily publications only.)

K. B. WARNER.

Sworn to and subscribed before me this 22d day of March, 1930.

Alice V. Scanlan

(My commission expires February, 1934.)

Calls Heard

(Continued from page 57)

WSDDK, Hosea Decker, 44 Campbell St., Delaware, Ohio

7000-ke. band

em2jm em5fl em8le em8yb emaz7 d4aes ear149 k4ac k4kd k6alm k6boe k6dv k6ewb k6oj nn1eob nn1fx nn1ae nn7e ti2fg li2wd vk2ns vk2ou vk3bq vk3bw vk3es vk3hl vk3ls vk3ml vk3pp vk3vp vk3wx vk4do vk4bh vk5gr vk5hg vk5it vk5jo vk5wr vk6sa vk3wi vk7wi vk7eh vk7dx zllft z2aac sb2bg z3as x1nq

14,000-ke. band

ct1bx ear96 f8hr g5by g6lv g6wl lu8dy on4ft py1el py1er py29h z2uo

AC8AG, Andre Guillabert, P. O. Box 1197, Shanghai, China

14,000-ke. band

aelts ae8jk ae8ls ae8mg exmk kaljr lu3de lu3dh pk2aj pk3bm py2ik vk2dy vk2jp vk2hb vk2hu vk2lv vk3go vk3lp vk3xo vk5gr vk5hg vk6sa vslab va3ab va6ag va6ah zllaa zllac zllan zllfb zllfw zllfx zllac zllas zllcm

W9UM-W9BOH, M. W. Macy, Lake Wauasee, Syracuse, Ind.

7000-ke. band

dhe fzo jes oyid pza sgen xw1m rpx 8aa x2x ekn xqj ja xvei xbb nurl obg rb45 55x cab1 wfa wfat wfbt vip h1la xfnih xbal kf4t obe cla nejn fga let fx7fx tip ngx d4az lete pxx wasq e2hr k5dd jap x7xdt s8lap gob hi2hi sb1a tg2elo fm8rit lu2ea vk2ar vk2aw vk2eb vk2dy vk2gj vk2he vk2hk vk2hm vk2ho vk2hu vk2hw vk2je vk2jh vk2jj vk2jt vk2ja vk2jk vk2ku vk2lv vk2no vk2na vk2ow vk2ra vk2rb vk2rf vk2rg vk2ak vk2wk vk2wu vk3ag vk3ak vk3ax vk3bq vk3bw vk3cp vk3er vk3es vk3ha vk3hk vk3hl vk3hw vk3oh vk3kj vk3jk vk3ls vk3ml vk3pa vk3pk vk3pp vk3pr vk3rg vk3rj vk3tm vk3sh vk3or vk3ru vk3vp vk3wo vk3wx vk3xf vk3yn vk4aw vk4bb vk4bd vk4bh vk4eg vk4em vk4do vk4hk vk4jr vk4ju vk4mf vk4mm vk5ax vk5bg vk5bj vk5da vk5do vk5gr vk5hg vk5it vk5ja vk5jh vj5jo vk5kj vk5mb vk5mm vk5nt vk5wr vk6fl vk6lg vk6mu vk6sa vk6wi vk7eh vk7cw vk7dx vk7lj vk7wi vk7wr on4p on4ka on4jo velda vefar vetbb vetbq vetep veldj velen ve1gk ve1gm vetpp ve5hy ve5em ve5eo ve5ep ve5ev rz1aa kdv5 ac8vr ac8go ti2ea ti2hw ti2wd ti2rs em2ar em2iq em2jm em2xa em2yb em5hy em5fe em5le em5m em5ry em8by em8le em8m em2mp em6ef emaz7 em8ur emaz4

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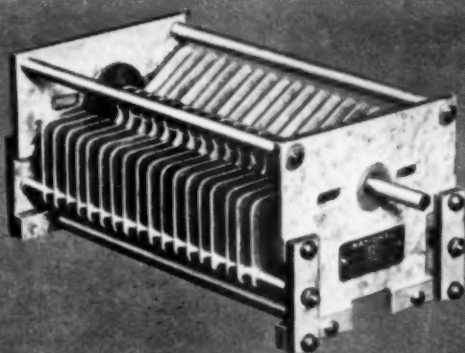
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densers for ama-
teur and experi-
mental uses can be
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volt series; and up
to .00025 mfd., 7500
volt series. Special
made sizes to
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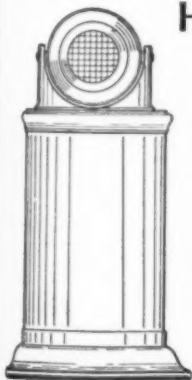
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and prices,
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ENGINEERS AND MANUFACTURERS
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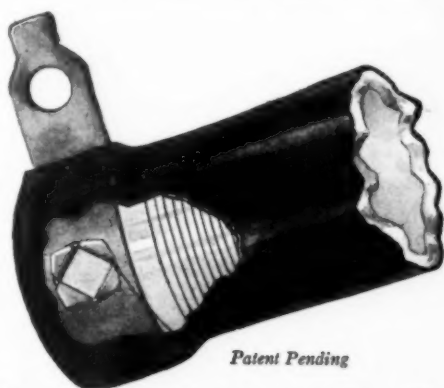
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ONE of them is shown above — the new Eyelet Contact that is now a standard part of every HH RESISTOR. It has been universally approved by Electrical and Radio Engineers for its effective reduction of contact resistance through increased, fixed contact areas between wire and terminal.

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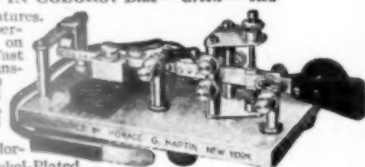
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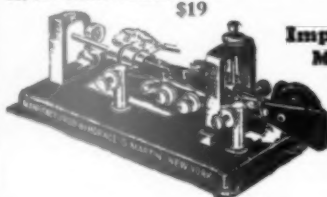
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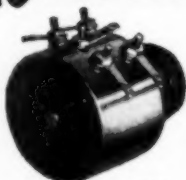
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em12 em29 em26 emSur em8uf f8rkl f8rem f8eay f8gyn
f8tpax g5by g5gy g5nl g6de k6bhl k6ceu k6cib k6eb k6ewe
k6oa k6evr k6ewb k9zag nj2pa x1ng x1g x5a x9a x29a x25a
em8rux vo8me al1aa al1as al1az al1bb al1bi al1fb al1fe
al1fr al1ft al1fu al2ab al2ac al2ad al2aj al2al al2aw al2bb
al2be al2be al2bh al2bs al2da al2bqd al2gl al2gn al2gp
al2gq al2dg al2ds al3ah al3aj al3as al3as al3bb al3bc al3bf
al3cm al3cn al3er al3ez al4ab al4am al4ao al4ap al4bi al4bo
al4xe nn1fx nn1nic nn7nic nn2ne nneab nnfx nn7e nn7aj
kalce kalhe kalhr kalpw kalre kalze kaidj ktkd ktdk
k4aan k4aa k4acf ear9t ox7eh helfg heldr helle he2je

W1ABG, 53 Lamb St., Lowell, Mass.

14,000-ke. band

ce5aa em2jt em8uf et1aa et1by et2aa d4xn f8axq f8es f8da
f8ex f8gdb f8fem f8fr f8hr f8lx fm8gke fo3sr g2bm g2gm
g2ma g5by g5bz g5is g5ml g6dh g6bg g6gs g6me g6qb g6rb
g6vp g6wt g6xb k8fb k8hg h8lf h8lle he2je j4rk k4dk k4kd
lu3dh lu4eo lu9ep nj2pa o4tj o4tl o4tq ontfn on4fn on4gn
on4tj on4tj on4ro pa0dw pa0tw pylah pylaw pyler py2bf
py2ik su8rs ve5al ve5ao ve5aw vk2wu vk3rk vk3wm vo8ae
vo8an vo8aw vo8me x9a al1ao al2ac al2bg al2gh zp7ab
zs1l zs2n zstm zs5u zu6a zu6n

7000-ke. band

ktdk vk5gr al2go

W9EBO, M. F. Whitton, U. A. Weiler,
Burlington, Wis.

7000-ke. band

zl3em zl3aj vk3ml vk5am vk7dx zl2aw vk3jk vk2ns zl2wa
k4kd x5a x5a wfat k6akx zl2ab em8uf x29a em8yb nneab
ti2rs al2gp vk7ch vk3rb vk4do k6euv vk2aw k6ac k4acf
oyid nn1nic al1bb al2wj vk3ml al1aa al1bi vk2vj al1fr
vk3rg vk3rb vk2hw helle vk2hk

11,000-ke. band

em5ex pylca pylah py2qb f8saw lu1ba pylaw lu5ae
helle et1aa lu2ab lu3dh

WSOT, W. J. Wiseman, 1296 12th St.,
Milwaukee, Wis.

7000-ke. band

em5fe em5fg em5fl em8le em8uf em8yb em257 em27 kflf
kfr5 kdv5 k4aan k6tdg h8lf h8lle nneab nn1nic nn7nic
nj2pa obg vk3av vk3vp vk5hg vk5jo x9a x9b x29a x1ng
xm2j xw1m ys1x ys5x ti2hv

W4AL, Senior High School, Asheville, N. C.

14,000-ke. band

pylaw py2ay py2bf lu3de lu4da lu5aj lu8dy lu9ot ce2aa
ce2ab ce5aa o4tj he2jm ti2hv k6alo ktdk ktdk et1aa g5by
on4tj on4tj f8fr f8da em1by em8uf em8yb ve1br ve2ea
ve3ej ve1bd ve1bu ve1bq ve3ej ve4bd ve1bu ve1bq ve1bx
ve5al ve9al x5a x9a nj2pa ru4my ve5ac

14,000-ke. 'phone band

w5ql w9drd w8lld w1agr ve3em cxeck wfegh w6bax
w6eel w6vz w6afd w7mo x9d ur4mf

W9COB, Fred Nowak, Chicago, Ill.

w6det w6daw w6ded w6li w6io w6ccj w6bgi w6ban w6edy
w6bpc w6bfb w6by w6ces w6bxv w6egd w6aay w6bek
w6cbw w6vz w6zq w6dyl w6ay w6dio w6dwi w6aao w6dwi
w6aao w6bxx w6dsp w6acg w6daz w6car w6bay w6bzi
w6dox w6vt w6ce w6dip w6dgn k6av k6avl k6dv w7aax
w7ks w7wb w7dp w7amb w7aed w7la w7bd w7asz w7alm
w7ajh w7anj w7amp ve2ea ve4bx em8yb ve2aa ve1pf
helle ve2am ve3ea ve1fk x9a nj2pa

W1AIX, Ed Waitt, 37 Wilfred Street, Lynn, Mass.

14,000-ke. band

zl3em w6aaz w6ama w6efw w6bix w6ceb w6bfb w6bw
w6vz w6agj w6eim w6te w6ts w6axm w6dev w6cum w6mx
w6eyi w6cyb w6eak w6ghi w6bys w6car w6cac w6acp
w6blk w6eif w6bpm w6oe w6dax w6ac w6cuj w6dgg w6dpl
w6bb w6bax w6bip w6daq w6bux w6bsn w6awp w6amp
w6kg w6eav w6fe w6aaz w6bdb w6bvx w6al w6aao w6bqk
w6clq w6dgg w6dgg w6ctp w6egh w6dmk w6bak w6cyb
w6eot w6ayj w6euk w6axk w6dya w6bux w6eug w6cis
w6ae w6ayz w6eyi w6fe w6afi w6brv w6egh w6box w6da
w6dln w6eks w6bjt w6ban w6exw w6vzw w6bin w6iet

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550	50,000 ohms	1—Cat. 507-68
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1500	60,000 ohms	3—Cat. 507-5 in series
2000	80,000 ohms	4—Cat. 507-5 in series

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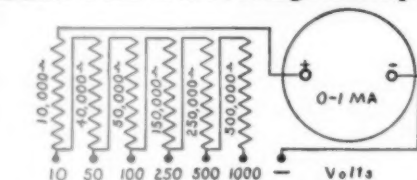
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175,000 to 250,000 ohms.....	2.50
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containing voltage multiplier data for the use of Super Akra-Ohm Resistors with milliammeters.



w6akf w6ael w6ee w6efa w6ajm w6bng w6etp w6bto w6brx
w6bto w6eje w6nqq w7aaz w7na w7ait w7aro w7nr w7iv
w7abd w7qr w7si w7acd w7aff w7mo w7qy w7af w7bd
w7wl w7amx x9a pylem pylaw lu3dh klfc claf ear65
qq1a g2gm lu8de lu2fi pylch em8uf lu9ee ce5aa oa4j pylah
lu3fa pp2 lu9dt ct1bx helle al2ac al4ax lu3he oa4l oa4q
fqpm hc2jm em2j k4dk nj2pa pylcw pylaa wfa lu3de p8ba
fm8gk py2as lu3fe pylcl ct1by claf x235 lu2re lu2aa
py2ay py2ih py2ik py1fb cmb3 py2sb oa4r lu2aej helig
x8a

Ross J. Konchar, 4500 North Artesian Ave.,
Chicago, Ill.

3500-ke. 'phone band

wlabv wlaox wlcu w2abf w3aex w3ain w5kx w8ahz w8ajh
w8bfx w8bke w8bce w8dec w8drt w8ih w8lt w8pw w8ed
w8wf w9ahk w9baq w9bfe w9bmm w9bqb w9cqd w9eku
w9ekw w9daq w9dcq w9fua w9fuu w9gw w9mm w9lak
wlamf wlasp wlaas w1bh w1bop w1bet w1bqf w1bl
w1emt w1cnj w1chs w1fn w1pi w1zs w1vi w2amr w2anz
w2apk w2arq w2bai w2bos w2boc w2bec w2bub w2bta
w2bia w2bmm w2bey w2bjj w2bdh w2bvc w2bds w2bjo
w2cgg w2pw w2qf w2wz w3aoo w3aaz w3anr w3att w3ah
w3blp w3bse w3ic w3lx w3pm w3eb w3im w3ej w3nk w3ar
w3oa w3aaq w3ahl w3abr w3akr w3ael w3akt w3abq
w3aef w3aiq w3fw w3ft w3gk w3gw w3ge w3hu w3ik w3qr
w3ty w3ve w3wq w3hj w3abl w3oc w3au w3aqy w3ana
w3nao w3jp w3ajj w3bbu w3bam w3bdd w3bdl w3bp
w3qe w3aea w3ms w3bfq w3ewf w3by w3ax w3etk w3lo
w6dpj w6byb w6eps w7ahw w7mo w7mb w7bg w7bd w8aa
w8aao w8awc w8aeh w8aaz w8adj w8aqh w8atz w8ad
w8aid w8adu w8axf w8aat w8aab w8agd w8bck w8bd
w8bkl w8bca w8boo w8bom w8bed w8bjk w8bas w8bmm
w8bti w8bey w8bgx w8bma w8bku w8bae w8bdk w8byz
w8bne w8ceo w8euj w8chq w8ebi w8dtl w8duw w8dpo
w8dan w8del w8dlg w8dui w8dei w8dgg w8dev w8djb
w8ldk w8dub w8eo w8ld w8mt w8nz w8on w8od w8pe
w8vy w8yb w9agk w9au w9ayd w9azy w9ajd w9arf w9aks
w9avy w9an w9ada w9acq w9amw w9apd w9bgn w9dyj
w9emg w9fis w9bjw w9bkw w9egn w9ese w9dns w9dlf
w9bac w9dks w9add w9es w9bsd w9bna w9dv w9df
w9dlh w9cax w9fd w9ciy w9faw w9ens w9fb w9enf w9bur
w9dmg w9ebz w9fnc w9dsz w9eca w9ebk k4dk

Ernest E. Peyssard, 26 Seguire Ave., Princess Bay,
Staten Island, N. Y.

3500-ke. 'phone band

wlaar wlabb wlabo wladt wlaqf wlagg wliag wlapg
wlabj wlamq wlaox wlapk wlauy wlbjd wlcjr wlcqk
wlclh wlere wlei wlio wlle wlqk w2abi w2adi w2ahg
w2aih w2aja w2ajw w2ama w2ani w2aow w2bia w2bis
w2blm w2boz w2brm w2brq w2bao w2bzx w2byu w2ba
w2cas w2cbe w2ff w2fr w2gj w2hy w2mg w2qn w2st w3abn
w2abq w3ac w2acm w3acv w3aex w3ain w3alq w3bp
w3apz w3asu w3bgd w3bo w3bq w3by w3ca w3cv w3gn
w3jz w3km w3mt w3oo w3ra w3ux w3vj w3wi w4ib w4lq
w4pk w5abq w5awg w6alz w6bbj w6cne w7acj w7ce w8abt
w8aci w8agu w8ahz w8ajh w8arw w8asd w8avq w8ayg w8azk
w8azo w8bap w8beg w8bia w8bmb w8bot w8bra w8bl
w8btk w8bxq w8bye w8efa w8el w8dbq w8dtk w8dr w8rw
w9aaf w9afn w9agx w9ahq w9avu w9bag w9bgd w9bjw
w9eaz w9fke w9fqf w9gim w9mm w9vbb w9vbb

VK5GR, G. B. Rogless, South Road, St. Marys,
S. Australia

14,000-ke. band

wladm wlang wlaqt wlawe wlbhm wlbjd wlbux wleek
wlcxm wlcow wlda wldp wldq wily w1kn w1om w1ve
w1vz w1wv w2abu w2af w2afj w2ai w2atz w2afv w2ary
w2aox w2ate w2avq w2bka w2bex w2bai w2bjg w2bmm
w2buw w2bda w2chd w2cmu w2cuq w2el w2fp w2ff w2gx
w2hq w2ku w2mb w2rd w2rs w2sn w2vd w2wl w2zg
w2acx w3aqz w3aiy w2ajd w3arw w3axx w3ake w3hg w3ges
w3km w3pf w3lz w3nk w3ut w3ra w4aef w4alg w4alb
w4kh w4fn w4sk w4ay w4we w5df w6de w8ada w8dth
w8buk w8brh w8bto w8bud w8bji w8bti w8box w8evo
w8eqr w8enx w8ejz w8gq w8fr w8dxv w8dsk w8drp
w8dlh w8djv w8fa w8gy w8ib w8rd w8amr w8qge w8ddy

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CITY OF ORIGIN HARTFORD, CONN.	SECTION OF ORIGIN W1SA	NUMBER 979	DATE OCT 6 47
To: BERN E. MELBATH W1CSC BLONCOE 107A		THIS MESSAGE WAS RECEIVED AT HARTFORD, CONN. STATION 10/6/47 8:23 P. 107A	
RELAY CHAIN BEING ORGANIZED BY KING OF ILLINOIS TO OPERATE BETWEEN THE PACIFIC COAST AND CHICAGO CALLS FOR CLOSEST COOPERATION BETWEEN IOWA AND ILLINOIS STOP SUB- BEST THAT YOU COMMUNICATE WITH WRAPP ON THE SUBJECT			
LOUIS R. STODD			
Rec'd	FROM STATION	LOCATED AT	DATE
Sent	TO STATION	LOCATED AT	DATE
W1CSC	PORT MADISON, IOWA	10/6/47	8:23 P.

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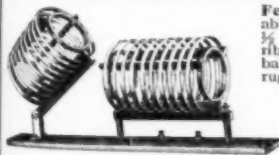
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